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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The D.S.I.R. Report

THE report of the Department of Scientific and Industrial Research for 1927–28, just issued, shows in a striking way the ramifications of modern science. So numerous are the subjects which are receiving attention that it is impossible to refer to all of them even in title.

The introductory remarks of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research deserve special quotation: "The year under review has been notable for a marked development of industrial research. Evidence of this reaches us in many ways: from personal contacts through industrial research associations, from the increasing interest taken in the work of the Department's research organisations, and from the enhanced demand for scientifically trained personnel. The rapid development of research in the chemical industry has even caused the Department some embarrassment through the resignation of many of the staff of the Fuel Research Station and Chemical Research Laboratory in order to take up research posts elsewhere. While the loss of experienced men is bound to delay to some extent the progress of investigations of general national importance, there is the compensating advantage that at a time when the expansion of work of more immediate industrial interest is highly desirable it is extremely helpful to industry to be able to turn to national organisations for the supply of men who appreciate at least some of the difficulties of getting practical results."

The general tone of the report is one of steady progress in every direction, and several developments of very great importance are described. Perhaps the most interesting is that, arising from the study of lead by the Non-Ferrous Metals Research Association, a series of new lead alloys has been discovered which, by reason of the fact that they are much stronger than pure lead, should be of great value in pipe and sheet manufacture. The Non-Ferrous Metals Research Association has shown that it is possible, by using these alloys, to make pipe 30 per cent. less in weight than the present standard material, with equal bursting pressure. Complaint is made that it is difficult to awaken the interest of the lead manufacturing industry; it is even suggested that if the possibilities of the industrial exploitation of this discovery in this country are not explored, it may be developed by foreign enterprise. While it is unthinkable that such a state of things should arise, the warning should not be allowed to fall on deaf ears.

A further sign of the close contact which the D.S.I.R. maintains with industry is the considerable amount of organisation and work devoted to the study of alloys for use at high temperatures. "They are essential," states the report, "for the modern heavy chemical industry. There is no reason to believe that the industrial successes so far obtained, striking as they are, indicate anything more than the opening up of a fresh field of industrial development." A special committee has been constituted to deal with this work, one of the duties of which will be to co-operate with industry. The Advisory Council is so impressed with the importance of the matter that it recommends that if any co-operative scheme is put forward by industry with the object of making comprehensive search for new and improved alloys, the D.S.I.R. should contribute half the cost.

From the point of view of the chemist, the most interesting part of the report is the section dealing with the activities of the Chemical Research Laboratory at Teddington, under the direction of Professor G. T. Morgan, F.R.S. At that laboratory important work on a number of subjects is being steadily prosecuted, the subjects including among others syntheses at high pressure; high pressure catalytic work; an examina-

tion of the constituents of low temperature tar and their industrial applications; the production of synthetic resins; and the therapeutical properties of various chemical substances. The last-mentioned matter is perhaps the most interesting development. A committee has now been constituted to organise work on chemotherapy, and, as a beginning, the chemotherapeutic aspects of various substances are being examined, while certain diseases are specifically mentioned as the object of special attention by the committee. The therapeutic side of chemistry has not hitherto received in this country the attention which it merits, and this aspect of the work of the Chemical Research Laboratory is therefore deserving of special encouragement.

The Synthesis of Hæmin

In the current number of the *Annalen der Chemie* there is announced the synthesis of hæmin (one of the decomposition products of hæmoglobin, the colouring matter of blood), which has been effected by Professor H. Fischer and one of his pupils. Various steps in the synthesis have been carried out from time to time, but only now is the chain complete. This synthesis marks an important milestone in our knowledge of the structure of hæmoglobin. Much of the pioneering work on the subject was done by Willstatter, Küster, and others, but the synthetic side has been for many years the subject of careful study by Professor Fischer and his students.

The lay Press of America has already seized upon the announcement of the synthesis as the occasion for enthusiastic accounts of its application to medicine, but Professor Fischer has very properly poured cold water on these suggestions. He points out that the work of Baeyer on the synthesis of indigo did not receive practical application until many years after it had been done. The synthesis of hæmin is only one step in our knowledge of the structure of hæmoglobin, and the road to the completion of that knowledge will be a long and hard one. Nevertheless, the synthesis is a triumph of organic chemistry, and Professor Fischer is to be congratulated on the skill and persistence which he has shown in solving a problem of appalling difficulty.

Professional Legislation in Quebec

The Association of Professional Chemists of Quebec is requesting the Legislature of that Province to pass legislation closing the profession. The necessary act suggested would make it illegal for any person to undertake chemical work as a chemist unless he is registered. A man with a title other than that of chemist could still legally do chemical work. If he described himself as a chemist, then he would have no legal standing as such unless he were registered with the Association above mentioned. It may be added that while the bill dealing with the necessary legislation is being vigorously supported, opposition to it is shown by many individual chemists, some university professors, and various associations of manufacturers.

Books Received

Department of Scientific and Industrial Research Report for the Year 1927–28. London: H.M. Stationery Office. Pp. 217. 4s.

Salt. By A. F. Calvert. London: Sir Isaac Pitman and Sons, Ltd. Pp. 151. 3s.

Maszanalytische Verfahren. By Erik Oeman. Berlin: "Zellstoff und Papier." Carl Hofmann. Pp. 120.

Dizionario di Merceologia e di Chimica Applicata. By Prof. Dott. G. Vittorio Villavecchia. Milan: Ulrico Hoepli. Pp. 1,223. L.60.

Homogeneous Catalysis. A General Discussion held by the Faraday Society. September, 1928. Pp. 200. 12s. 6d.

Catalytic Processes in Applied Chemistry. By T. P. Hilditch. London: Chapman and Hall, Ltd. Pp. 360. 16s.

The Silk and Rayon (Artifical Silk) Directory and Buyers' Guide of Great Britain. Manchester: John Heywood, Ltd. Pp. 386. 21s.

The Calendar

Feb.		
4	Royal Society of Arts: Cantor Lecture. "The Treatment of Coal." III. Dr. C. H. Lander.	John Street, Adelphi, London
4	Society of Chemical Industry (London Section): "Petroleum as a Source of Synthetic Material." Dr. A. E. Dunstan. 8 p.m.	Burlington House, Piccadilly, London
4	Institution of the Rubber Industry: "China Clay as a Compounding Ingredient in Rubber." W. F. O. Pollett. 7.30 p.m.	Blackfriars Theatre, New Bridge Street, London.
5	Hull Chemical and Engineering Society: "Ice-making." G. H. Barron. 7.45 p.m.	Grey Street, Park Street, Hull
5	Northern Polytechnic Chemical Association: "Soap Bubbles." Dr. R. S. Clay. 8 p.m.	Holloway, London
6	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London
6	Society of Chemical Industry (Nottingham Section): "Simplified Methods of Electrometric Analysis." Dr. T. Callan. 7.30 p.m.	University College, Nottingham.
7	Chemical Society. 8 p.m.	Burlington House, London
7	Royal Society: Discussion on "The Structure of Atomic Nuclei." 4.30 p.m.	Burlington House, London.
7	Institute of Chemistry (Manchester Section): "Mechanism of Atomic Structure—Significance of the Thiele Hypothesis." Professor C. K. Ingold.	Manchester
7	Society of Dyers and Colourists (West Riding Section): "The Action of Alkalis on Cotton and Artificial Silks." A. J. Hall.	Bradford
8	Chemical Engineering Group. "The Rôle of Surface Energy in Chemical Engineering." Professor W. E. Gibbs.	London
8	Institute of Metals (Birmingham Section): "Electro-Deposition." D. J. MacNaughton. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham
8	Institute of Metals (Sheffield Section): "Some Recent Developments in Nickel Metallurgy." W. T. Griffiths. 7.30 p.m.	University, Sheffield
11	Ceramic Society: "Heat Resisting Steel for Kiln Supports." "Flow of Heat in Furnace Walls." J. Sarjant. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent
11	University of Birmingham Chemical Society: "Some Stereochemical Problems." Dr. W. H. Mills.	University, Birmingham
12	Institution of Petroleum Technologists. 5.30 p.m.	John Street, Adelphi, London.
12	Institute of Metals (N.E. Coast Section): "Metallurgy of Engineering." J. E. Newson. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne
13	Institute of Fuel. "The Coal Burning Art as applied to Steam Production." W. D. Wylde.	London

National Research in Chemistry

Report of the Department of Scientific and Industrial Research

The report of the Department of Scientific and Industrial Research for the period August 1, 1927, to July 31, 1928, just issued (H.M. Stationery Office, pp. 217, 4s.), contains much information of chemical interest, including a report of the work in progress at the Chemical Research Laboratory at Teddington.

Of all the work organised by the Department of Scientific and Industrial Research, it is, perhaps, that of the Chemical Research Laboratory at Teddington which is of the greatest interest to chemists. In regard to this work, it is stated in the report now under consideration that with the transfer to the laboratory at Teddington of researches previously carried out for the Chemistry Co-ordinating Research Board of the D.S.I.R. in various institutions, and the organisation there of certain new researches which fell outside the province of that Board, *e.g.*, researches on tars produced by carbonisation of coal at low temperatures, it became desirable to appoint a new Board under whose review should fall the whole of the work of the Laboratory. Accordingly, on the recommendation of the advisory council (of the Privy Council committee for Scientific and Industrial Research) there was appointed a Chemistry Research Board of the D.S.I.R. with the following terms of reference :—(i) To supervise generally the researches undertaken at the Chemical Research Laboratory and any other researches referred to the Board on the recommendation of the advisory council ; (ii) To submit annually a programme of work for the ensuing year with special reference to any new work it is proposed to undertake ; (iii) To submit an annual report on the whole work of the Laboratory.

The members of the Chemistry Research Board are Sir Richard Threlfall (chairman), Dr. G. C. Clayton, M.P., Professor F. G. Donnan, Sir Robert Robertson, and Professor J. F. Thorpe, C.B.E., D.Sc., F.R.S. The following have been appointed assessors to the Board on the nomination of their respective departments :—Dr. F. E. Smith (Admiralty), Dr. G. Rotter (War Office), and Mr. D. R. Pye (Air Ministry).

Work at the Chemical Research Laboratory, Teddington

The chemical study of low temperature tar is one of the matters with which Professor Morgan and the staff at Teddington are closely concerned. The solvent process, which obviates the use of high temperatures, has been applied to the separation of the major constituents of low temperature tar, as this procedure diminishes the possibility of destructive thermal changes in the composition of the tar.

When distilled up to 120° C., wet tar yields light oil and aqueous liquor and the residual dry tar is freed from acidic and basic constituents by successive extraction with dilute caustic soda and sulphuric acid. The remaining neutral oil is again distilled up to 120° C. under 1 mm. pressure, a second yield of light oil being obtained. From an ice-cold acetone solution of the residue, wax melting at 54° C. is obtained, and on cooling further to −82° C. more wax melting at 10 to 20° C. can be isolated. By treatment with petrol and cooling, the heavy neutral oil yields aromatic hydrocarbons. During these processes, amorphous solids amounting to approximately 5 per cent. of the tar are collected, whereas the pitch obtained from the same tar by distillation processes amounts to 30 per cent. of the tar.

Various Constituents of Low Temperature Tar

Among the constituents of the tar, two homologues of anthracene have been identified, namely β-methylanthracene and 2 : 6-dimethyl-anthracene. Certain quinones of the anthracene series have been obtained. A coloured hydrocarbon melting at 320 ° C. and showing some of the characteristics of the naphthacene groups has been isolated in the pure state.

The basic constituents have been separated into volatile liquids and amorphous solids (resinamines). The latter have been shown to be true resins, and among the former the following have been identified :—Aniline, α-picoline, 2 : 4- and 2 : 6-lutidines, *sym*-collidine, quinoline and quinaldine.

The material extracted from the tar by caustic soda (33 per cent.) has been shown to consist of true phenols (13 per cent.) and phenate soluble impurities (20 per cent.). The phenolic fraction has yielded mobile oils of b.p. 180–220° C. (9 per cent.) and amorphous solids (resinols) (3 per cent.), the latter, like the resinamines, being true resins. Amongst the lower phenols, phenol has been identified and *sym*-xylenol isolated.

The phenolic constituents and their chlorinated products have been examined in regard to their bacteriological properties, and it has been shown that chlorination increases materially the efficacy of the more volatile fractions. The crystallisable phenols and the resinols are promising materials for use as lacquer intermediates.

Complex Constituents of Coal Tar

Considerable progress has been made in a study of substitution in the acenaphthene nucleus, and 2-nitro-acenaphthene and 2-aminoacenaphthene have been identified. Acenaphthene itself has been shown to yield with considerable readiness a formaldehyde resin having interesting properties. These discoveries have formed the subject matter of two patent applications. In the perylene series the preparation of 1 : 12-perylene quinone has been studied and improved. A dinitroperylenequinone has been prepared for use as an intermediate in the making of perylene vat dyes. This work on acenaphthene and perylene has now been discontinued.

Research on Chemotherapy

In the last report, reference was made to the joint discussion between the D.S.I.R. and the Medical Research Council on the furtherance of general investigations for the discovery of substances of therapeutical value. As a result of these discussions, the Medical Research Council set up a research committee, three members of which are nominated by the D.S.I.R. The D.S.I.R. provides the funds for such chemical researches as are considered to be desirable, and several grants have been made in aid of researches with the object of producing compounds of value in the treatment of malaria, sleeping sickness and other prevalent diseases.

In this connection, investigations have been begun at the Teddington Laboratory in collaboration with the Medical Research Council on a systematic survey of various nuclei and substituent groups, more especially with reference to the production of therapeutic agents for the treatment of sleeping sickness. This work, regarded as a search for therapeutic agents, must be in the first instance of an *ad hoc* character ; but it is hoped that experimental evidence on the relationship between chemical constitution and physiological activity will be gained, making possible logical searches in the more promising fields.

Compounds containing acenaphthene, fluorene, naphthalene and carbazole nuclei are being prepared. Tellurium derivatives of *ortho-*, *meta-* and *para*-cresols have been isolated with a view to their examination as chemotherapeutic agents.

Water Pollution

After a comprehensive examination of the literature on base exchange silicates and the base exchange method of water softening, a report has been communicated to the Water Pollution Research Board on the existing knowledge of the subject, dealing both with the industrial and technical applications of the process and with academic work of a fundamental nature. Samples of base exchange water softening materials have been collected from various commercial firms, and are now being examined.

High Pressure Research

The plant at Teddington now includes three 500 cubic feet water sealed gas holders, two compressors and high-pressure storage cylinders corresponding with each gas holder. The whole of the compression system has been rearranged during the last year in order to simplify control and operation. Two circulatory systems, each of which includes reaction vessels, condensers, receivers and circulators, have been assembled; the catalyst spaces in the two systems are 200 c.c. and 2½ litres respectively.

Research has been continued on the catalytic organic synthesis with gases under conditions of high temperature and pressure. This has included further investigations on the synthesis of methyl alcohol. Comparatively large quantities of the alcohol have been produced and quantitative experiments conducted on rates of production. At a rate of

flow corresponding to 33,000 volumes per hour per unit volume of catalysts the methyl alcohol produced at 380 C. and 200 atmospheres pressure approximated closely to twice the volume of catalyst space.

Modification in the catalyst has resulted in the production of *n*-propyl, *iso*butyl and higher homologous alcohols. With a catalyst rich in cobalt the product contained appreciable quantities of ethyl alcohol. This product also contained small quantities of aldehydes suggestive of the mechanism by which carbon linking arises.

Helium Extraction

Experiments are being conducted on the extraction of helium from monazite sand. Thorium, Ltd., have kindly promised to supply sand for extraction work, free of charge, provided that their subsequent thorium process is unaffected by the helium extraction treatment. A small extraction plant has been set up in which the monazite sand is heated in special heat-resisting steel pots to a temperature between 900–1,000° C. The resulting gas containing approximately 86 per cent. helium (the remainder being hydrogen, carbon monoxide, carbon dioxide and nitrogen) is purified by simple apparatus which yields a gas containing approximately 90 per cent. helium and 10 per cent. nitrogen. The nitrogen is removed in a subsequent process, and the purified helium is to be compressed into small cylinders.

Synthetic Resins

Investigations on phenolic-formaldehyde resins have included the production of fusible resins by acidic condensation and of infusible resins by alkaline condensation. The latter reaction has been extended to the large scale plant using 24 lb. of *meta*-cresol at a time, with condensation in acetone solution in the presence of caustic soda. The resulting syrup after washing with saturated aqueous thiosulphate and drying over sodium sulphate, is incorporated with wood meal and compressed at 130° C. under a pressure of 1½ tons per square inch. Electrical measurements on moulded test pieces carried out in the National Physical Laboratory have given mean values for the breakdown voltage of 600–800 volts per mil. These values, which correspond with those obtained in the small scale condensations, are considerably higher than values published for trade resins. Powdered paper and starch have been tried as "fillers" in lieu of wood meal with promising results.

The objects of the study of fusible resins produced by acidic condensation of the three cresols and formaldehyde in alcoholic solution are the raising of the melting points, the elimination of colour and the isolation of crystalline intermediate products. *Meta*- and *para*-cresols give resins with high insulating values and melting above 100° C. An almost colourless resin has been produced from *meta*-cresol. With all three cresols, crystalline products have been isolated and identified as dihydroxyditolyl-methanes.

Corrosion of Metals

The work of the Corrosion of Metals Research Committee has been largely devoted to the study of the factors which control the rate of corrosion of zinc in potassium chloride solutions. For the first time a complete set of curves has been recorded, showing the variations in time of the rates of total corrosion, corrosion due to hydrogen gas evolution, and corrosion due to oxygen absorption. The curves for the latter, for the first part of their courses, are either exponential (in dilute solutions) or straight lines (in strong solutions). The exponential form is obtained when the concentration of chlorine ions is the controlling factor, the straight line form when the rate of oxygen supply controls corrosion. Accumulations of secondary corrosion products only affect the form of the curves after unexpectedly long periods.

The work on atmospheric corrosion has included the investigation of the properties of oxide films produced on zinc by exposure to air at various temperatures between 150° and 390°. The properties of the films so produced were investigated by determining the weight-increments on subsequent exposure to the atmosphere. Work on the analysis of corrosion products has necessitated the investigation of methods of estimating small quantities of carbonate in the presence of sulphide and chloride. Attempts have been made to improve and preserve the appearance of copper specimens exposed to the air, and progress has been made in planning laboratory investigations with synthetic atmospheres.

Most of the experimental work has been carried out at the Royal School of Mines. The move to the Chemical Research Laboratory was made in April, since when the time has been mainly occupied in installing and testing apparatus designed to accelerate the output of experimental work.

General Research at Teddington

In connection with the foregoing investigations of substances of therapeutic interest, work has been continued on organic derivatives of antimony and selenium. In the latter case, the interactions of selenium oxychloride with phenol and its homologues have been examined in some detail with the object of elucidating certain inaccuracies in the literature of the subject. Selenonium bases of a new type have been discovered.

The ethylenethiourea complex salts of gold, silver, copper and other metals have been further studied, and determinations of the electrical conductivities of these complex salts have shown that in aqueous solution these substances similate the behaviour of the corresponding salts of the alkali metals.

Relationship of the Laboratory with Chemical Industry

In the preceding year, visits to the Chemical Research Laboratory were paid by the Dyestuffs Industry Development Committee of the Board of Trade and by the Association of Tar Distillers. These inspections, which were much appreciated by the two groups of visitors, have led to many subsequent visits from individuals interested in the chemical study of low-temperature tar and in the high-pressure researches. Among these visitors have been prominent members of the Gas Light and Coke Co., and an arrangement was made with this company whereby two of their chemists were allotted places in the Laboratory for the study of high-pressure reactions and allied researches. Four officers of H.M. Patent Office, specially interested in high-pressure reactions, paid a visit to the Laboratory and saw the methanol process in operation. They also inspected the other large and small scale researches.

The net expenditure on the Chemical Research Laboratory during the year ended March 31, 1928, amounted to £15,013, the gross expenditure being £15,748, and the receipts £735.

Other Aspects of the Report

Apart from the account of the work of the Chemical Research Laboratory, the report of the Department of Scientific and Industrial Research contains numerous other matters of interest. With regard to patents, it is stated that during the year 18 applications for British patents have been made, together with foreign and Colonial counterparts in suitable cases. Eleven British and foreign patents have been abandoned or allowed to lapse. The new applications relate to retorts, methods of treating coal (including low temperature carbonisation), methods of hydrogenating coal, the treatment and separation of constituents of low temperature tar, the manufacture of synthetic resins, aldehydes and alcohols, metallic compounds of thiourea, acenaphthene derivatives, iron and iron-beryllium alloys. Further licences have been granted in connection with the patents covering the colouring of aluminium and its protection against corrosion.

An account of the metallurgical work of the D.S.I.R. is given in the Monthly Metallurgical Section.

New American Fabric Used in Parachutes

A NEW silk fabric, known as "Mock Leno," developed by the U.S.A, Bureau of Standards in co-operation with silk manufacturers, has been adopted by the Navy Department for use in parachutes, three hundred and twenty-six parachutes having been manufactured from it during the past year. Heretofore Japanese imported fabrics have been used exclusively for this purpose. "Mock Leno" appears to possess all the desirable characteristics of the Japanese Habutai, except that its permeability is slightly higher. Its resistance to tear is considerably higher than Habutai, which makes the new product highly desirable for use in parachute construction.

The Silk Association of America is continuing its co-operation with the Bureau of Standards in an effort to develop a plain-woven domestic silk which will have all the advantages of the Japanese Habutai, with the added advantages of greater strength and resistance to tear. A number of samples of plain-woven silk have been manufactured by members of the Silk Association of America and are now undergoing tests at the Bureau of Standards.

The Treatment of Coal

Dr. Lander's Second Cantor Lecture to the Society of Arts

This year's Cantor Lectures of the Royal Society of Arts are being delivered by Dr. C. H. Lander, Director of Fuel Research, who has taken as his subject "The Treatment of Coal." The second of the series of three lectures (of which the first dealt with the use of coal in the raw state) was delivered on Monday, and dealt largely with gasworks and coke oven practice. It is given in abstract below.

In the second Cantor Lecture, given at the Royal Society of Arts on Monday, Dr. Lander began by dealing briefly with some of the more recent work on the constitution of coal. He pointed out that only comparatively recently had the work of different experimenters tended to converge and produce results of tangible importance.

Bone had interpreted his researches on the extraction of coal by various organic solvents as showing that a group of nitrogenous "humic" bodies, varying in quantity according to the nature of the coal, could be extracted by benzene under pressure, and he considered that these bodies were mainly responsible for the coking propensities of coking coals. Wheeler and Francis had developed a method of studying coal composition which they termed "Rational Analysis." A rational analysis of any coal could be given in terms of the proportions of free hydrocarbons and resinous compounds, organised plant entities and ulmins. Some confusion existed regarding the interpretation of the term "decomposition point" of coal. It was quite clear that it was necessary to distinguish between products distilled from the coal without change and those resulting from the decomposition, however slight, of organic matter.

High Temperature Carbonisation of Coal

High temperature carbonisation formed the basis of two large and important industries, the technique of which had been the subject of experiment for something like 100 years. The function of the gas industry was to provide a centralised supply of gas at the lowest possible cost to the consumer. The aim of the coking industry, on the other hand, was to produce coke of a type which should make the overall operations of the iron and steel trade profitable.

Change in Gas Consumer's Requirements

A revolution in the gas industry had taken place during the last 25 years through the change in the consumer's requirements from illuminating value to heating value. Before the inception of the Gas Industry Act (1920), experimental work by the industry and the Fuel Research Board had shown clearly that within certain limits the consumer's requirements both for high and low temperature production, such, for instance, on the one hand as the heating of incandescent mantles, or on the other hand, the carrying out of boiling or cooking operations, could be served equally well by low as by high calorific value gas provided the same total quantity of heat were delivered in both cases. This had led to the introduction of the thermal method of charging for gas. Some of the reduction which had taken place in the price of gas since the application of the Act was undoubtedly due to the measure of freedom it gave the gas manager to adapt his operations to his own local conditions.

Development of Continuous Vertical Retorts

Another gradual change during the past 20 years was due to the development of continuous vertical retorts which now produced about half the total gas made. The advantages of vertical retorts were: (1) Less ground space than horizontals; (2) Less labour costs per therm; (3) Lower fuel consumption; and (4) Production of dryer coke. On the other hand, they were more susceptible to variations in the type and quality of the coal. They worked best with nut coal, and would not deal satisfactorily with some fine slacks, while horizontal retorts would take any coking coal of any size and give satisfaction.

From the point of view of gas production and coke quality, blending was of more advantage in horizontals than verticals. Verticals required a higher grade of intelligent control, but since this already existed in most works it could not fairly be counted a disability.

Scrubbing for Benzol

Dr. Lander remarked upon some other points affecting the gas industry which he ventured to think were not always thoroughly appreciated. For instance, scrubbing for benzol had been very little practised since the war, the argument being that with gas at say 10d. a therm, the value of the heat content of the benzol if allowed to remain in the gas was the equivalent of 1s. 3d. per gallon. If the cost of extraction were 7d., and the cost of distribution 6d. a gallon, then the cost of gas works benzol without any profit into the consumers' car would be 2s. 4d. per gallon.

Although admittedly it would in any case be difficult to compete with petrol at its present price, he doubted whether such arguments were altogether sound. It must be remembered that since the gas supply had to be maintained, benzol extraction would entail an increase in the amount of coal which had to be carbonised, and taking everything into consideration, the cost of liquid benzol to the gas company might be considerable less than the figure assigned to it on the above assumptions. Further, increased extraction of benzol in gas works would be a great national advantage through tending to reduce the amount of motor spirit imported.

Coke

On the coke side, the necessity was pointed out of supplying gas coke as dry and clean as possible. Dry coke could be obtained by greater attention to quenching. Clean coke could be made only from clean coal. If there were a greater demand for washed or cleaned coal, it was possible that the collieries might be able to supply it at a lower price than they had to charge at present.

Dr. Lander said that he could not stress too strongly the question of cleanness of the raw material if a fuel were to be made for household purposes, whether by gas works, coke ovens, or low temperature processes. It was a curious fact, although one quite capable of explanation, that 7 per cent. of ash in a coal burned in the raw state in a household appliance, was much less obvious and less of a nuisance to the householder than was 7 per cent. of ash in a coke of any kind.

Coke Oven Practice

Some of the considerations mentioned were equally applicable to coke oven practice, but it was emphasised that at any rate at the present time the major output of the coke ovens was used for blast furnace purposes.

Dr. Lander emphasised the necessity of installing an experimental large-scale coke oven plant in this country, so that the effect of changes in working could be accurately studied. The present method of relying on bag tests was uncertain and frequently led to misleading results. He also deplored the tendency in this country for industry to look at the aggregate cost of the research work which it undertook, losing sight of its cost relative to the large interests involved.

He thought that the appointment by the Board of Trade of a Committee to consider the possibilities of closer co-operation between gas works and coke ovens in a certain defined area was a step which would clear up many uncertainties and controversies.

The Indian Oil Industry

The increasing imports of oil-crushing machinery into India show that the oil mill industry is prospering. In Bombay a new company has been registered for oil crushing purposes, and will begin operations within a short period with up-to-date machinery. The Tata Oil Mills have been showing continuous losses for some years past, but as the Chairman of the Board explained at the annual general meeting held recently, there are signs of improvement. The company suffered loss during the past year, but this was mainly due to the difficulty of getting rid of the coconut cake and the low prices of cake. Various alterations and additions to the plant are being made, which, when completed, will materially increase the productivity of the mills.

Death of Mr. Rudolph Muspratt

We regret to announce the death of Mr. Rudolph Muspratt, only son of Sir Max and Lady Muspratt, which occurred in Liverpool on Monday. He was twenty-four years of age, and had been married only sixteen months. An emergency operation for an acute attack of appendicitis was performed on Saturday, January 19, and there was a second operation, but complications followed, and he never recovered.

Educated at Holly Lea, Liverpool, Clifton College, and St. John's College, Oxford, Mr. Muspratt took great interest in both his work and in athletics. He took an honours degree in chemistry, and played for Oxford at both cricket and Rugby football. On leaving Oxford he went to the Canadian Salt Co. for six months, where he went through all departments for experience, starting as a manual worker. It was in Canada that Mr. Muspratt met his bride, Miss Constance Lloyd Davies, daughter of Mr. M. L. Davies, of Toronto, president of the Standard Chemical Co. of Canada, and a director of the North American Chemical Co.

On returning to England, Mr. Muspratt entered the service of Imperial Chemical Industries on the directive side of the Labour Department at Widnes. He had some experience in politics as deputy chairman of the Widnes Division Conservative Association, and only a fortnight ago accompanied Dr. G. C. Clayton, M.P., to Prescot, and there delivered his first speech in support of Dr. Clayton. In August of last year he was admitted a Liveryman of the Worshipful Company of Dyers, and thus became a Freeman of the City of London.

Death of Dr. W. J. Bowis

We regret to announce the death of Dr. William John Bowis, O.B.E., Ph.D., F.I.C., which occurred on Friday, January 25. Dr. Bowis was technical director of Boots Pure Drug Co., Ltd. Born at Nottingham in 1881, he was educated at the People's College. He entered the employment of Sir Jesse Boot in 1897, and was at first engaged in the firm's analytical laboratories. From 1903 to 1905 he studied chemistry under Professor Alfred Werner at the University of Zürich, and took part in Werner's researches on the co-ordination compounds of cobalt, receiving the Ph.D. degree of Zürich University in 1905. His work was subsequently published in *Annalen*, 1914, **406**, 261. After this he had a practical training in pharmacy, and became a member of the Pharmaceutical Society in 1908. He then returned to industrial work, and was largely responsible for the development of the soap and perfumery business of Boots Pure Drug Co., Ltd., of which he became a director in March 1909. During the war, he took a large part in organising the production of gas masks in Boots' factories, and was made an O.B.E. in 1919. He became a Fellow of the Institute of Chemistry in 1919, and was also a Fellow of the Chemical Society, and a member of the Society of Chemical Industry and of the Chemical Industry Club. He married Caroline Ellen Gillman, who survives him. Dr. Bowis was a man of great ability and a very genial disposition, and the loss created by his death will be greatly felt.

Industry Peace Hitch

The first expressed opposition to the proposed National Industrial Council from the employers' side is contained in a report published during the week by the Council of the British Engineers' Association. The chief objections in the report are: That the very brains of industry, the management, the technical staff, and other salaried staff employees are apparently to have no opportunity of contributing their great knowledge and experience and wisdom to the deliberations of a National Industrial Council; that the General Council of the Trades Union Congress is not necessarily competent to deal with the industrial, economic and financial matters included in the proposed agenda; that the General Council represents less than 4,000,000 out of 12,000,000 insured persons in industry and trade; that the General Council cannot be dissociated from the Labour party. The report concludes that the objections are to the specific proposals under consideration, and would not necessarily apply to the examination and discussion of industrial problems by suitable competent authorities provided that the object was to discover practical ways and means of restoring prosperity to our depressed industries.

New Czechoslovakian Chemical Journal

Papers in English and French

Owing to the limited number of readers who understand Czech, the Czechoslovak chemists have hitherto published their chief works in journals outside their own country. Nevertheless, many important communications still remained untranslated in the archives of the Czech learned societies and institutions. This circumstance has not allowed a real international knowledge of the actual chemical scientific researches carried out in Czechoslovakia. A new journal entitled *Collection of Czechoslovak Chemical Communications* has, therefore, been established, under the joint editorship of Professor E. Votocek and Professor J. Heyrovsky. The first number, which has just appeared, contains four papers—three in French and one in English, and presumably it is intended to publish all papers in the commoner languages of science. The editors state that this journal has been founded in order to publish in full extent the more important communications concerning "pure" chemistry, provided they have not previously been published in any widely known language. Besides this, the *Collection* will include a bibliography of all publications of Czechoslovak chemists and reviews of their books. The venture is aided by the Czechoslovak Board of Education, and is under the patronage of the Bohemian Royal Society of Sciences. It will appear monthly, the annual subscription being equivalent to 26 Swiss francs, *i.e.*, 170 Kc (£1). Subscriptions may be forwarded to Professor J. Heyrovsky, Charles University, Prague II, Albertov 2030, Czechoslovakia; or to Dr. G. Druce, 26, Heslop Road, London, S.W.12.

Bicentenary of Josiah Wedgwood

The Council of the Ceramic Society has decided to hold a celebration of the bicentenary of Josiah Wedgwood. This in 1930, at some date to be fixed later. As part of that celebration a commemoration volume will be published. This volume will contain, among other things, a paper by Wedgwood (from his notebooks), prize essays on his technical work, and papers sent in by members of the Ceramic Society.

In this connection the Council of the Ceramic Society offers two prizes for the best papers or essays on the "Contributions of Josiah Wedgwood to the Technical Side of the Pottery Industry." The competition is open to non-members as well as members of the Society. Each competitor's paper is to extend to anything less than 20,000 words. The first prize will be thirty-five guineas, and the second prize fifteen guineas. The successful papers are to be the property of the Ceramic Society, and it is intended to publish them in the proposed Bicentenary Commemoration Volume. Josiah Wedgwood and Sons, Ltd., have kindly placed the Museum at the disposal of competitors. The Society reserves to itself the right of withholding one or both prizes if the papers are not up to the required standard. All papers must be sent to the Secretary of the Ceramic Society, Stoke-on-Trent, not later than March 31, 1930.

Firedamp Explosions

As the result of investigations previously carried out by the Safety in Mines Research Board, means have been devised to allow for complete or partial release of the pressure developed by firedamp explosion within closed vessels, such as the casings of electric switchgear, and at the same time to ensure that the flame of the explosion shall not pass from the casing to the atmosphere outside. Experiments carried out by Beyling in Germany have suggested, however, that, when the casings are divided into inter-communicating compartments by partitions, the ignition of an explosive mixture in one compartment might result in considerably enhanced pressure being produced in the other. An account of an investigation into this possibility is contained in a paper entitled "Firedamp Explosions within Closed Vessels: 'Pressure Piling,'" by C. S. W. Grice and R. V. Wheeler (Safety in Mines Research Board Paper No. 49, published by H.M. Stationery Office, price 1s. net). The research has shown that if an explosion of firedamp and air is allowed to propagate from a casing of comparatively large volume through a narrow opening into a casing of comparatively small volume, pressures considerably above the normal are very rapidly produced.

Reviews

THE PROBLEM OF FERMENTATION: THE FACTS AND THE HYPOTHESES. By M. SCHOEN. Translated by H. LLOYD HIND. 1928, London: Chapman and Hall, pp. 211. 21s.

THIS is a book that may be read, not only "with edification" but with pleasure. In a preface to it Professor Fernbach writes: "The continuous evolution of scientific knowledge demands from time to time a review of the past in order to measure the road which has been covered. In this M. Schoen's book cannot fail to be of service to all who, for one reason or another, are interested in fermentation." We can endorse this opinion. The monograph gives a very clear and useful summary and discussion of recent work, with copious references to the original literature and a bibliographical index of 36 pages.

In the main, the book consists of an admirably arranged and lucid discussion of the probable sequence of events in the breakdown of hexose sugars to alcohol and other products by yeasts and bacteria—whether the changes proceed through lactic acid as intermediary or through pyruvic acid or methylglyoxal. Not only is ordinary alcoholic fermentation dealt with, but other important industrial fermentations, such as those of lactic acid and of acetone and butyl alcohol. The remaining five chapters discuss the stereoismerism of hexoses and some special fermentations, the role of phosphates, of the reaction of the medium and the conception of hydrogen-ion concentration (Ph) in relation to fermentation. A special chapter, not in the original French edition, has been written for the English translation, on the part played by "active hydrogen" in fermentation.

Perhaps the greatest merit of the work is the lucidity and clearness with which facts and arguments are presented. The translator has done his work well and retained these features, as also what he terms the "dramatic force of the original." It is not merely a translation but an excellent presentation of the author's book.

Without too much depreciating the value of the book—indeed, without any desire to do so—we would add a few words of criticism. The title, "*The* Problem of Fermentation," leads one to expect more than is given; what we get is "Some Aspects of the Problem." There is much left untold. Chapters II and III, which deal with the enzyme theory of fermentation, are distinctly incomplete and leave the impressions that this theory has a much more slender base than is actually the case. Special prominence is given to Rubner's view in a paragraph entitled "Restriction of the enzyme theory," that "only 2 to 5 per cent. of the total work of the yeast fermentation is done by zymase" and that "the sugar is partly decomposed by a vital action by the living matter." The strongest arguments for the general validity of the enzymic theory are not given.

That yeast and other organisms depend almost entirely for their fermentative action upon their enzymes and that these are the picklocks or crowbars by which they are able to break down complex molecules, is shown most strikingly by the very selective action of certain yeasts according to the nature of the enzymes which they are capable of forming and of yielding as definite preparations. Thus the maltase free yeasts, such as *S. Marxianus, S. Exiguus, S. Anomalus* and the Indian "toddy" yeasts will not ferment maltose, although they readily ferment dextrose, laevulose, and saccharose. When fermenting other sugars along with maltose, they leave it untouched. *S. Apiculatus* and *Torula Monosa*, which cannot be made to yield invertase, will ferment only dextrose and laevulose. The difference between top and bottom yeasts in regard to their action on raffinose is another example of difference in action due to difference of enzymes. In all these cases the action of the yeasts is so specific that they may be used as the most accurate means of separating the sugars in analysis. Some of the moulds, particularly *Aspergillus Oryzae*, are veritable portmanteaux of enzymes; and these enzymes can be separated in a dry form, as in Taka-diastase, which is capable of producing a whole series of degradations, both of proteins and carbohydrates, similar to those effected by the parent moulds.

Rubner's argument that the diminution of fermentative action of yeast which is brought by "gentle treatment" with salt, points to a "vital action" of the yeast in fermentation, rather than an enzymic, and ignores the enormous effect of traces of chloride in modifying certain enzyme changes, for example, the action of amylases of pancreatin.

It is, in fact, from the point of view of the enzymic actions involved that the present work is most liable to criticism. It will, perhaps, be possible in later editions to rectify this, which at present counts as a defect. The whole subject of the changes during the growth of yeast under aeration, as in modern yeast manufacture, is left untouched. In spite of the limitations indicated, we give the book a hearty welcome, as it collects together in a single monograph a vast deal of scattered information.

W. A. DAVIS.

FIXATION OF ATMOSPHERIC NITROGEN. By F. A. ERNST. London: Chapman and Hall. Pp. 154. 12s. 6d.

This book, which is one of a series of industrial chemical monographs published under the general editorship of W. L. Lewis and H. E. Rowe, deals with the present position of the fixed nitrogen industry. It is written, as the author states in the preface, rather for the business man than for the technician familiar with the subject; and it accordingly contains numerous statistics, some of which, especially those dealing with the capacity and position of synthetic ammonia plants, are necessarily influenced by movements which have taken place since the year of compilation (1927).

As would be expected in a book of this nature, relatively little space is devoted to the scientific principles underlying the various methods of fixation; and it is perhaps inconsistent with the general policy of the volume to discuss mathematically, in a short chapter on the synthesis of ammonia, the effect of the deviation of gases from Boyle's law on compressor design, and to include constructional details of suggested plant, when similar well-known details of standard forms of plant used in actual practice are omitted.

These, however, are small points. The volume, on the whole, forms a valuable addition to the literature of nitrogen fixation, especially as a concise collection of numerical data and as an outline treatise on the subject from an American standpoint.

E. B. M.

New Fumigant for Stored Products

ETHYLENE oxide is a fumigant not hitherto used for exterminating insects, but recently discovered by the United States Department of Agriculture to be highly toxic to certain species. Those commonly infesting stored food products, clothing, and furniture can, it is stated, be easily killed by the vapours of ethylene oxide in concentrations that can be used without danger from fire and that are not dangerous to human beings. Clothes moths, carpet beetles, rice weevils, saw-toothed grain beetles, Indian meal moths, red-legged ham beetles, and flour beetles all succumbed to this new fumigant when it was used experimentally for a period of 20 hours in the proportion of 1 lb. of ethylene oxide to 1,000 cubic feet of space. For commercial fumigation work, the Department of Agriculture, however, recommends that the fumigant be used at double this quantity per 1,000 cubic feet of space. Comparative tests indicated that the vapours of ethylene oxide are somewhat more toxic to stored-product insects than are those of carbon disulphide and about thirty times as toxic as those of carbon tetrachloride.

Owing to its low boiling point, ethylene oxide is effective at comparatively low temperatures, ranging from 60° to 75° F. It has excellent powers of penetration. Insects buried in over-stuffed furniture, sealed in packages of cereals, and buried in jars of grain were killed with ease. No deleterious effect was noticeable when the commercial strength of the fumigant was used for 24 hours on commodities, foodstuffs of various types, clothing, furniture, and metals. Such foodstuffs as nut meats and dried fruits were unaffected, and no foreign taste or odour was discernable after removal from the fumigation chamber. No liquid foods were treated. Preliminary tests in a vacuum fumigation tank show that ethylene oxide can be successfully used for this type of fumigation. Seeds for planting purposes, however, should not be fumigated with ethylene oxide, since the vapours seriously affect the germination. Wheat was used for the germination experiments.

British Industries Fair, 1929

To the Editor of THE CHEMICAL AGE.

SIR,—In connection with the chemical section at the British Industries Fair, it is possible that you may be interested in the following action of the Association of British Chemical Manufacturers which is being taken at the instance of council :—

The Association, in pursuance of its constant policy of stimulating and maintaining the connection between research and industry, has invited every Professor of Chemistry at recognised Universities and Technical Colleges throughout the country, together with their assistants, research and senior students, to visit the Fair in organised parties. Through the co-operation of the Department of Overseas Trade, these parties will be taken round the chemical section in the mornings by competent guides, so that the various exhibits may be explained in detail. By this means, they will be brought into direct contact with the very latest developments in the chemical world. Not content with this, and believing that qualified teachers of chemistry in general would benefit by first-hand acquaintance with the latest triumphs of British chemical industry, the Association has also sent an invitation to all recognised teachers of chemistry in public and secondary schools throughout the country. The Fair offers perhaps the finest opportunity of seeing the latest developments in chemical industry, and it is hoped to make this educational aspect a permanent feature of future Fairs. A list of teachers anxious to take advantage of these facilities is therefore being prepared for use on future occasions.

I shall be very much indebted to you if you can manage to give publicity to these arrangements, as, although we have tried to make our lists as exhaustive as possible, it is probable that your journal will reach other teachers of chemistry that we have missed.—Yours, etc.,

J. DAVIDSON PRATT,
General Manager.

The Association of British Chemical Manufacturers,
166, Piccadilly, London, W.1.
January 25.

Mercerising Patent Dispute

Judgment Reserved

MR. JUSTICE CLAUSEN, in the Chancery Division, on Monday, reserved judgment in the action by Samuel Heap and Son, Ltd., of Rochdale, against the Bradford Dyers' Association, Ltd., the hearing of which had lasted six days. The claim was for an injunction restraining infringement of the plaintiffs' patented process for mercerising cotton in fabrics containing artificial silk without damaging the silk. The defendants, according to their counsel, did not deny infringement, but alleged that there was no patentable subject matter in the invention.

In the course of the case, Mr. Whitehead, K.C., counsel for the Bradford Dyers' Association, Ltd., said that if this patent were held to be valid, nobody would be able to mercerise cotton in the old way if the fabric containing it also contained cellulose acetate silk. Mr. Whitehead said he attacked the validity of the patent, because the claims made for the process were so wide that, if it were upheld, a new method of mercerising mixed cotton and artificial silk fabrics would have to be found. It would mean that if goods which contained artificial silk were sent to defendants for mercerising, they would have to be very careful to see that they contained no shred of cellulose acetate silk.

Replying for the plaintiffs, Sir Arthur Colefax, K.C., said the whole case turned on the question whether it was obvious to all properly informed persons that cellulose acetate silk in a fabric containing cotton would not have its dyeing and other properties materially altered if the cotton in the piece were mercerised in the ordinary way. He said it was not ; and that the discovery which the patentee revealed to the world was that, if a piece of fabric containing cotton cellulose acetate silk was put through the ordinary mercerising operation, the remarkable and wholly unexpected result was obtained that the silk did not lose any of its valuable qualities. The process was entirely novel, and the discovery on which it was founded was quite unknown in 1922. Nobody before that date had mercerised a mixture of cellulose acetate and cotton, and it was not obvious that it could be done.

Profit-sharing in the Chemical Industries

(FROM A CORRESPONDENT.)

THE return of profit-sharing and co-partnership for the year 1927, recently published by the Ministry of Labour, differs very little from that of 1926, the acute depression through which industry in general was passing continuing to have an adverse effect. In businesses other than co-operative societies in all trades throughout Great Britain and Northern Ireland, 207 schemes were known by the Ministry to have been in operation at the end of the year. Out of 409,400 workpeople employed by the firms running these schemes, 208,500 were eligible to participate. Returns were made to the Ministry of 212 schemes, embracing 169,300 workpeople, out of 264,900 employed. An average bonus of £8 19s. 7d. was paid, giving an addition to wages of 3·9 per cent. In what follows, certain details of the matter as affecting the chemical and allied industries are given. It should, however, be remembered that the figures deal with 1927. They do not, therefore, include schemes such as that of Imperial Chemical Industries, Ltd. (with 40,000 employees), whereby employees have opportunities of acquiring shares on especially favourable terms, in addition to numerous other privileges.

In the glass, chemical, soap, oil and paint group of trades 15 schemes were known to be in existence at the end of the year. These schemes embraced approximately 29,700 workpeople, out of a total of 52,000 employed. Details are given of nine schemes, and to each of the 25,700 participating employees an average bonus of £5 12s. 3d., or 3·5 per cent. on wages, was given. These figures compare with ten schemes making returns in 1926, having 21,400 participating employees, who received an average of £6 8s. 3d., or a 3·8 per cent. addition to their wages. Fourteen new schemes were introduced during the year, and three were discontinued. None of these, however, possessed any direct chemical interest.

Types of Profit-sharing Schemes

The present report, which is longer than usual, gives an analysis of the types of profit-sharing schemes in operation in 1927. Broadly speaking, they come under three heads : Profits were distributed by (1) the issue of shares, either free or on specially favourable terms as to price or dividend ; (2) payment of interest varying with the profits on deposits made by employees ; and (3) payment to employees in cash or shares, or credited to pension or similar funds. An interesting explanation is given regarding methods (1) and (2) : " In the case of the share-purchase schemes the employee is usually offered shares on terms more favourable than those open to the ordinary investor. The mere holding of shares by an employee is not in itself regarded for the purpose of the Department's statistics as an example of profit-sharing ; but where specially favourable terms are accorded to the employee-investor the scheme is included in the statistics as being an example of profit-sharing, although of a rather special and limited kind. Similarly, those schemes which give to employees who deposit money with the firm a guaranteed minimum rate of interest, together with a further dividend varying with profits, are treated as examples of profit-sharing, although not of the normal type. These two special types of arrangement accounted for 85 of the existing schemes," which, as mentioned above, numbered 297.

There was one " deposit " scheme included in the chemical group, the remaining eight having 25,600 participants, who received an average of £5 12s. 4d., giving an addition to earnings of 3·5 per cent., which result shows a very slight improvement on that yielded when all classes of schemes were included.

Leicestershire (L. and N.) Coal Distillation

IT is anticipated that an issue of capital will be made shortly in connection with Leicestershire (L. and N.) Coal Distillation, which has been formed to erect and operate commercial units for coal distillation by the " L. and N." process in Leicestershire. It is computed that when the plants are in full operation the company will treat nearly half a million tons of British coal per annum. In order to secure control of suitable coal supplies, arrangements have been made to purchase the whole of the ordinary shares of the Leicestershire Colliery and Pipe Co. The directors include the Duke of Montrose, Lieut.-Colonel Moore-Brabazon, and Mr. Frank Hodges.

Manufacture of Laminated Glass

Paper Before Society of Glass Technology

THE 112th meeting of the Society of Glass Technology was held in University College, London, recently, the president, Mr. W. Butterworth, Senr., occupying the chair.

A highly interesting paper entitled "A Brief Outline of the History, Development and Methods Employed in the Manufacture of Laminated Glass" was communicated by Mr. W. R. Lyttleton (works director of the Triplex Safety Glass Co., Ltd.). He stated that the principle of securing a tough material between two hard and relatively brittle sheets for decreasing splintering under impact had long been known. One of the pioneers in the manufacture of this type of glass was an Englishman, Woods. His efforts in 1905 were not wholly successful in marketing the product. About 1910, a Frenchman, Benedictus, met with more success, and La Société du Verre Triplex, which manufactured his article was still in business. Similar efforts were made in America about the same time. Since the war, many firms in England and America, a few in France and Germany, and one in Czecho-Slovakia had manufactured this strengthened glass.

The methods used varied considerably. A layer of nitro-acetate cellulose as transparent and free from cloud or any defects as possible, was securely fastened to glass sheets. In order to give long service an adhesive cement was employed to hold the levers together. In one method of manufacture, in order to obtain a perfectly clean surface on the glass plates they were cleaned with rouge and washed in running water. When dry, the plates were evenly coated with a suitable gelatine solution, and then this in turn was dried in warm filtered air. An enamel or varnish was applied to the dry gelatine. Two prepared sheets of glass and a suitable sheet of celluloid were then placed in an alcohol bath at a definite temperature and assembled as a "sandwich" with the celluloid in the centre. The sandwich was then subjected to pressure in a hydraulic press, air bubbles and excess fluid being pressed outwards. In order to exclude moisture from the adhesives, the cellulose was "cut back" around the edges of the glass, and the space was filled with pitch, bitumen, varnish or paint. The laminated glass was then ground, polished, and prepared for use in the usual ways. Cellulose acetate and nitro-cellulose might discolour and become brittle, but use was made of high-boiling solvents to overcome this difficulty.

Messrs. J. T. Randall and R. E. Leeds, of the Research Laboratories of the G.E.C., read a paper on "A Simple Test for the Detection of Iron in Glass Sands." The test consisted in heating the materials in an atmosphere of hydrogen at a temperature of 1,000° C. for half an hour. The iron oxides were reduced, and in the case of a sample of builder's sand the resulting iron had been separated by means of a magnet. The materials became much darker in colour after reduction, the presence of iron being easy of detection. It had been found possible to use coal gas in place of hydrogen.

The same authors read a "Note on the Reduction of Glasses in Hydrogen." Experiments were described showing how pieces of glass rod had been heated in an atmosphere of dry hydrogen, over a temperature range of 500° to 1,200° C. Exposure for half an hour was sufficient to affect reduction. Glasses containing arsenious, lead or ferric oxides became discoloured, the depth of colour depending upon the chemical composition. The application of this test to the detection of impurities in soda-lime-silicon glasses was discussed.

Large Extension of B.D.C. Works

THE Mayor of Huddersfield, a guest at the annual meeting of the Huddersfield Chamber of Commerce, on Friday, January 25, said he had learned that the British Dyestuffs Corporation branch of Imperial Chemical Industries intended to spend £300,000 on extending and improving their works and plant at Dalton, near Huddersfield, and the extensions, when completed, would mean employment for about another 1,000 people. For several years past the British Dyestuffs Corporation have been improving their works at Dalton and concentrating them at this point. Hitherto the works have been scattered over a wide area stretching from Dalton to Turnbridge.

Chemical Matters in Parliament

Dead Sea Salt Concessions

IN reply to Colonel Howard-Bury (House of Commons, January 28), who asked what progress had been made in regard to the Dead Sea salt concession, Mr. Amery said that he was still awaiting a reply from the Trans-Jordan Government on points of detail which they had raised in connection with the draft concession.

Flour Improvers (Chlorine)

Lieut.-Col. Heneage (House of Commons, January 28) asked the Minister of Health if his attention had been called to the use of chlorine for improving certain inferior grades of foreign flour; and if it was proposed to take any action in the matter? The Parliamentary Secretary to the Ministry of Health (Sir Kingsley Wood) replied that the Minister was aware that chlorine was sometimes used for the treatment of flour, but he understood that its use was diminishing, and, having regard to such considerations as the danger of increasing the cost of bread and of driving the milling trade abroad, he was not at present proposing to take any action in the matter.

Lautaro Nitrate Co. Developments

Further Grounds Acquired

THE local board of the Lautaro Nitrate Co., in Valparaiso, have acquired for the company 102 estacas of nitrate grounds of 1,000,000 square metres each, estimated to contain about 100,000,000 quintals of exportable nitrate of soda.

Under present circumstances (says a circular issued by the company's chairman, Mr. J. O. Herrera) these grounds are of special interest, as they consist of a uniform layer of good ley caliche, wholly superficial which will enable the extraction and manufacture to be effected at a cost considerably below to-day's level. By the employment of material at present lying idle in those of the company's oficinas which are not producing, and the completion of the new plant with the most up-to-date mechanical devices, the local board hope to reduce the average cost of production to an amount which will fully justify the expense of the proposed increase of capital and the cost of new buildings and plant.

Subscription by Vendors

It is proposed to increase the company's share capital to £8,000,000, from the present authorised and issued amount of £6,560,000, by the issue of 288,000 shares in series of 96,000 ordinary "A" shares, 96,000 ordinary "B" shares, and 96,000 ordinary "C" shares. The purchase price of these grounds is 4¼d. per metric quintal and payment will be made by drafts on London at ninety days' sight. The vendors have undertaken to apply for the 288,000 new shares at par.

The 96,000 ordinary "A" shares are to participate in dividends on commencement of production at the first oficina to be built on the new grounds, which oficina will have a capacity of at least 120,000 tons per annum. The 96,000 "B" shares will not participate in dividends prior to November 28, 1932, or the date of completion of the second oficina of the same capacity, whichever date is the earlier. The 96,000 ordinary "C" shares will not participate in dividends prior to November 28, 1933, or the date of completion of a similar third oficina, whichever date is the earlier.

The price of 4¼d. per metric quintal of nitrate contained in the grounds under the above conditions compares very favourably (states the circular) with that of 8d. and cash payment at which the last sale of nitrate grounds was made at a public auction by the Chilean Government about two months ago. In addition, the Chilean Government has agreed to allow the importation free of duty, of all the materials necessary for the construction of the oficinas and plant to be erected.

Although the minimum capacity of the proposed three oficinas is fixed at 120,000 tons per annum, it is the intention of the local board to erect oficinas of a larger capacity so as to ensure the lowest possible cost of production.

According to communications from Valparaiso, it is the primary object of the local board to reduce cost of production to a level that will make it possible to reinstate the company to its former prosperity.

From Week to Week

LORD AND LADY MELCHETT left London on Saturday, January 26, for the South of France for a short visit.

THE ALUMINIUM CO. OF AMERICA states that it is building a new works in Algoma, Tennessee, for the production of aluminium alloys especially duralumin. This is thought to be due to air transport developments in the United States.

THE COLWYN GOLD MEDAL of the Institution of the Rubber Industry has been awarded to Professor G. S. Whitby, of McGill University, Canada. Professor Whitby has been engaged on the study of rubber problems for 15 years.

THE GERMAN JOURNAL of chemical abstracts, *Das Chemische Zentralblatt*, has reached its centenary. The first number appeared on January 14, 1830, as the *Pharmaceutischen Centrallblatt*. The title was changed to the present one in 1856.

THE DIRECTORS of the Werntaru Colliery, Pencoed, near Bridgend, have decided (writes our South Wales correspondent) to erect extensive by-product plant at the colliery. The details of the scheme are now being considered, and it is hoped that the work of erection will start within the next few months.

A MEETING of the Dominion Tar and Chemical Co. is called for noon on Monday, February 4, at the registered offices, to pass the following resolution: That the company be wound up voluntarily and that Mr. Harold Fitch Kemp, of 36, Walbrook, London, E.C.4, chartered accountant, be appointed liquidator for the purpose of such winding up.

THE WORKING AGREEMENT between the Verein für Chemische Industrie A.-G., of Frankfurt, and the N.V. Allgemeen Norit Maatschappy, of Amsterdam, has been renewed. The Norit Vereenigung Verkoop Zentrale, Amsterdam, will continue to distribute activated charcoals of all kinds, and the Chem. Werke Carbon G.m.b.H., of Frankfurt, will act as its representative for sales in Germany, the Saar, and Switzerland.

A RUSSIAN NATIVE SOURCE for camphor has been discovered in a species of wormwood that grows on the sandy steppes of the Government of Astrakhan. An oil extracted from this plant has been subjected to investigation at the Saratow experiment station, and is said to have yielded a good quality of camphor. The crystals differ in their physical properties from those of camphor obtained from camphor trees, but chemically are identical with it.

IN PURSUANCE of the resolution passed at the extraordinary general meeting of the shareholders of the Barrenechea Nitrate Co., Ltd., held on November 5 last, the company's oficina, nitrate grounds, plant and stocks have now been transferred to Senor B. R. Lopez under the terms of the agreement dated October 24, 1928. A circular issued by the secretary says that the purchase consideration of £25,000 has been received, and the directors have decided to convene a meeting for the liquidation of the company for February 6, at 12.30, at 27, Leadenhall Street, London.

IT IS OFFICIALLY STATED that during the early part of 1928 the study in the Federated Malay States of the amounts of plant nutrients removed from the soil by tapioca made satisfactory progress. The deterioration of jelutong on storage was further investigated, and attention was also given to variations in the moisture content of individual blocks of jelutong. Information was published regarding the utilisation of pineapple waste, and the possibility of producing a potable spirit from this material. Work was commenced on the toxic content of the roots of different species of "tuba."

A JOINT MEETING of the Amalgamated Society of Dyers and Bleachers and the Scottish Federation of Dyers and Bleachers was held on Thursday, January 24, in the St. Enoch Station Hotel, Glasgow, to consider the position relative to the threatened dispute in the industry in the west of Scotland. A basis of settlement was reached which will be recommended by the Wages Board delegates to the members of the union for acceptance. The district council, at a meeting held later, approved of the report of the Wages Board delegates, and agreed to recommend the members of the union to accept the proposals. The District Council is forwarding the report to the National Executive at Bradford, with the recommendation that the Executive Council ratify the proposals.

N'CHANGA COPPER MINES, LTD., is to take over the proprietary rights over 30,000 acres from the Rhodesian Congo Border Co., payment being made in shares. The capital is to be increased from £600,000 to £3,000,000 by the creation of 2,400,000 new shares of £1 each. Minerals Separation, Ltd., have agreed to relinquish their position of general managers of the company in favour of the American Smelting and Refining Co., who will be given a firm contract subject to their exercising an option on 356,250 of the new shares and subscribing their proportion of the subsequent issues and retaining a substantial interest in the company, thereby securing the benefit of the outstanding experience of the American Smelting and Refining Company, and their knowledge of the copper business generally. Mr. H. A. Guess, a vice-president of the American Smelting and Refining Co., has joined the board.

THE DANISH SUPERPHOSPHATE INDUSTRY has a productive capacity of 300,000 tons per year.

UNIVERSITY NEWS.—The degree of Ph.D. has been conferred on Mr. T. A. Jenkinson for research carried out during the past three years in the Colour Chemistry Department of the Huddersfield Technical College, under the direction of Dr. H. H. Hodgson.

A COMPANY has been formed in France with a capital of six million francs, under the title L'Ammoniaque de Liévin, which will work in conjunction with the Liévin coal company to produce ammonia by the Claude process. Coke ovens dealing with 2,000 tons of coal per day have been built.

MR. C. R. GROVES, M.Sc., A.I.C., has been appointed head of the metallurgy department at the Constantine Technical College Middlesbrough. Mr. Groves, who is 39 years of age, is at present a lecturer in metallurgy at the Bradford Technical College. In addition to a considerable scholastic experience, he has served with Kynoch, Ltd., and at Hadfield's steelworks, Sheffield.

THE COMMISSION OF INQUIRY into the Holborn gas explosions continued its sittings this week. Evidence was given that a lighter had been found near the scene of the explosion. After Monday's sitting of the inquiry the members of the commission went to the Imperial College of Science and Technology, South Kensington, to witness an experiment by Professor W. A. Bone, F.R.S., in connection with the origin of explosions.

M. BOURGEOIS, French representative on the advisory committee of the League of Nations on the traffic in drugs, has revealed the fact that the French Government has been approached with a view to its granting permission for the transit of four tons of heroin (diacetylmorphine) through France from Germany for shipment from a French port to North China. This follows on an earlier revelation by Sir Malcolm Delevigne that 3,500 lb. of heroin had been exported to Holland by a Basle firm.

FIFTY-SEVEN MINERAL CLAIMS covering an ore zone 700 to 800 feet in width and approximately 4½ miles in length have been staked for the Consolidated Mining and Smelting Co. of Canada, Ltd., in the interior of British Columbia, about 100 miles from Stewart. The claims are on the Naas River slope between the head of Twenty-mile Creek and the Unuk River. Samples of ore are stated to give values in gold and silver and to carry a high arsenic content, in addition to which cobalt bloom is prominent all over the surface of the zone.

AN EXTRAORDINARY GENERAL MEETING of the Mond Nickel Co., Ltd., was held on Monday for the purpose of considering a resolution effecting certain alterations in the company's articles of association. The Hon. Henry Mond, deputy-chairman of the company, who presided in the absence of Lord Melchett, the chairman, said that the proposed alterations were formal changes necessary in order to effect the exchange of shares of the company into stock of the International Nickel Co. of Canada, Ltd., as economically and expeditiously as possible. Up to the present they had had 90 per cent. of assenting shareholders of both classes. The resolution was unanimously approved.

LEEDS CORPORATION GAS COMMITTEE is considering a proposal for the leasing or purchasing of the York Street Gas Works for the establishment of a low temperature carbonisation plant. The York Street Works are the oldest as well as the smallest works owned by the Gas Department. They were constructed in 1818, and were taken over by the Corporation in 1870, since which date they have been entirely remodelled. They were rendered out of date by developments on the New Wortley and Meadow Lane Works, and with the exception of a few weeks before Christmas, 1927, they have been closed down since 1923. The plant it is proposed to install is similar to that which the South Metropolitan Gas Co. have adopted.

Obituary

DR. ANTHONY MCGILL, on December 29, 1928, aged 80, at Berkeley, California. He was born in Scotland, but spent his life in Canada, reaching the position of Chief Dominion Analyst. He was a Fellow of the Royal Society of Canada, and past chairman of the Ottawa section of the Society of Chemical Industry.

MR. ALEXANDER C. THOMSON, senior chemist to Scottish Oils, Ltd., on Monday, January 21, at Mid Calder. Mr. Thomson had throughout a long lifetime been associated with the Scottish oil industry at Tarbrax Works and Oakbank Works, and for a number of years at Middleton, Uphall. He was a Justice of the Peace and a member of Midlothian County Council.

MR. BERNARD COVENTRY, C.I.E., at Herne Bay on January 26, aged 69. He went out in 1881 to the then flourishing Bihar indigo industry, and rose to be manager and part proprietor of the Dalsingh Sarai indigo concern. He was much more impressed than most of his planter contemporaries by the dangers to the industry of the synthetic process of indigo manufacture, which, in the absence of a progressive policy in Bihar until it was too late, brought the industry to decay some years before the war. He urged on the planters the need for research, and in 1899 he started an agricultural research station on modern lines.

References to Current Literature

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The assay for platinoids in ores. J. Watson. *J. Chem., Met. and Mining Soc. of South Africa*, November, 1928, pp. 115–118.

GENERAL.—Blue rock salt. F. C. Guthrie. *Nature*, January 26, p. 130.

The action of bromine on strontium oxide and some of its hydrates. H. B. Dunnicliff, H. D. Suri, and K. L. Malhotra. *J. Chem. Soc.*, December, 1928, pp. 3106–3111.

Interactions of selenium oxychloride and phenols. G. T. Morgan and F. H. Burstall. *J. Chem. Soc.*, December, 1928, pp. 3260–3270.

The hydrogenation of coal tars. G. Hugel. *Canadian Chem. and Met.*, January, pp. 5–7, 17.

PAINT.—Scientific aspects of paint technology. L. A. Jordan. *J.S.C.I.*, January 25, pp. 13–21T.

United States

ADHESIVES.—Significance of mechanical wood-joint tests for the selection of woodworking glues. T. R. Truax, F. L. Browne, and D. Brouse. *Ind. and Eng. Chem.*, January 1, pp. 74–79.

Nature of adhesion between glue and wood. A criticism of the hypothesis that the strength of glued wood joints is chiefly due to mechanical adhesion. F. L. Browne and D. Brouse. *Ind. and Eng. Chem.*, January 1, pp. 80–84.

ANALYSIS.—The electrometric titration of manganese by the Volhard method. B. F. Brann and M. H. Clapp. *J. Amer. Chem. Soc.*, January, pp. 39–41.

Ceric sulphate as a volumetric oxidising agent. VIII.—The determination of chromium in the presence of manganese, iron and vanadium. Preparation and stability of solutions. H. H. Willard and P. Young. *J. Amer. Chem. Soc.*, January, pp. 139–149, 149–153.

APPARATUS.—A simple apparatus for the determination of carbon dioxide. R. C. Wiley. *J. Amer. Chem. Soc.*, January, pp. 222–223.

BACTERIOLOGY.—A bacteriological conductivity cell and some of its applications. L. B. Parsons, E. T. Drake, and W. S. Sturges. *J. Amer. Chem. Soc.*, January, pp. 166–171. A new method of studying the biochemical activities of certain organisms involving a combined culture conductivity cell has been developed, and applied to the study of anærobes at different hydrogen ion concentrations, temperatures, and oxygen pressures. It is suggested that the cell may be applied to the study of any metabolic process involving the production of conducting substances from slightly or non-conducting substrates, or to the effect of antiseptics, etc.

ECONOMICS.—A model system of chemical cost accounting. L. Staniforth. *Chemical Markets*, January, pp. 37–41.

GENERAL.—Detoxicated cottonseed meal. P. Menaul. *Oil and Fat Industries*, November, 1928, pp. 333–336. The toxic constituent of the meal, e.g., gossypol, is decomposed if the moisture content of the meal is raised to 40 per cent. and it is then heated above 100° C., preferably with steam under pressure. The residual meal is non-toxic.

Gas Masks. Y. Henderson. *Chemical Markets*, January, pp. 51–52.

Crystal growth in aqueous solutions. I.—Theory. W. L. McCabe. *Ind. and Eng. Chem.*, January 1, pp. 30–33. The following problem from the field of industrial crystallisation is proposed: Given a saturated solution in which is suspended a known weight of seed crystals of known screen analysis, and assuming this solution to be cooled under known conditions, what will be the weight and screen analysis of the crystals at the end of the process if there is negligible formation of new nuclei? A theoretical solution of this problem is developed.

METHANOL.—The equilibrium between methanol, carbon monoxide, and hydrogen. Preliminary paper. D. F. Smith and B. F. Branting. *J. Amer. Chem. Soc.*, January, pp. 129–139.

OILS.—The spontaneous heating of oils. N. J. Thompson. *Oil and Fat Industries*, November, 1928, pp. 317–326.

German

ANALYSIS.—The determination of water by distillation with hydrocarbons. W. Boller. *Chemiker-Zeitung*, January 23, p. 70.

The determination of paraffin hydrocarbons in commercial benzol and motor fuels. R. Heilingötter. *Chemiker-Zeitung*, January 26, p. 79.

The determination of the smallest quantities of lead by electrolysis. A. Seiser, A. Necke, and H. Müller. *Zeitschrift angewandte Chem.*, January 26, pp. 96–98.

A method for the determination of total nitrogen in urea nitrate mixtures. R. Lucas and W. Hirschberger. *Zeitschrift angewandte Chem.*, January 26, pp. 99–100.

APPARATUS.—Apparatus for the determination of "escape" [of material to be adsorbed] in adsorption plants. A. Mackert. *Chemische Fabrik*, January 23, pp. 39–40. Describes a means whereby the escape of material to be adsorbed (indicating saturation of the adsorbing material) may be determined.

COLORIMETRY.—Colorimetry by means of the immersion colorimeter. R. Wasmuht. *Chemische Fabrik*, January 23, pp. 37–38.

FIRE EXTINCTION.—The extinction of fire by foam. O. Treichel. *Chemiker-Zeitung*, January 23, p. 69.

GENERAL.—The zinc rod in the Leclanché cell. C. Drotschmann. *Chemiker-Zeitung*, January 9, pp. 29–31; January 16, pp. 49–50; January 23, pp. 66–68.

Contributions to the systematic knowledge of indicators. XV.—Phenolphthalein and some of its indicators. A. Thiel and L. Jungfer. *Z. anorg. Chem.*, Vol. 178, Part 1-3, pp. 49–72.

The preparation of hydrogen fluoride in the pure state and its conductivity. K. Friedenhagen and G. Cadenbach. *Z. anorg. Chem.*, Vol. 178, Part 1-3, pp. 289–299.

ORGANIC.—The synthesis of hæmatoporphyrin, protoporphyrin, and haemin. H. Fischer and K. Zeile. *Annalen der Chem.*, Vol. 468, Part 1, pp. 98-116.

Double salts of phenyldiazonium iodide with mercuric iodide, and the formation of diphenyliodonium salts by the decomposition of these double salts. A. N. Nesmejanow. *Z. Anorg. Chem.*, Vol. 178, Parts 1–3, pp. 300–308.

RUBBER.—Isoprene and rubber. XIV.—The degradation of caoutchouc and guttapercha. H. Staudinger and H. F. Bondy. *Annalen der Chem.*, Vol. 468, Part 1, pp. 1–57.

Miscellaneous

ANALYSIS.—The deposition of radium and other alkaline earth metals at the dropping mercury cathode. J. Heyrovsky and S. Berezicky. *Collection of Czechoslovak Chemical Communications*, January, pp. 19–46 (in English). By means of a recording instrument called the polarograph, the method of electrolysis by the dropping mercury cathode may be applied to the determination of small quantities of radium, barium, and strontium, and (roughly) to magnesium.

GENERAL.—The chemical constitution of clupanodonic acid. M. Tsujimoto. *Bulletin Chem. Soc. Japan*, December, 1928, pp. 299–307 (in English). After investigation of the decomposition of the ozonides of clupanodonic acid and its amyl ester, two alternative formulæ for the acid are put forward.

INORGANIC.—The complex oxalates of scandium. J. Sterba-Böhm and S. Skramovsky. *Collection of Czechoslovak Chemical Communications*, January, pp. 1–18 (in French).

ORGANIC.—Rhamnoconvolvulic acid. E. Votocek and F. Valentin. *Collection of Czechoslovak Chemical Communications*, January, pp. 47–54 (in French).

3 : 12-Dihydroxypalmitic acid, a component of rhamnoconvolvulic acid. E. Votocek and V. Prelog. *Collection of Czechoslovak Chemical Communications*, January, pp. 54–64 (in French).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

302,629. Hydrogenation of Coal and Like Carbonaceous Material. C. H. Lander, F. S. Sinnatt and J. G. King, 16, Old Queen Street, Westminster, London, S.W.1. Application date, September 17, 1927.

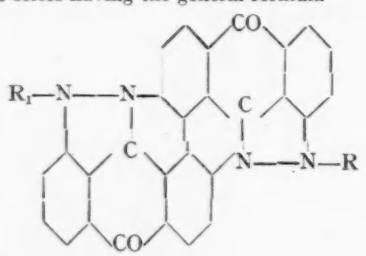
In the hydrogenation of coal, etc., the whole of the gas passing over the coal has been treated to reduce its content of sulphur and other volatile compounds. In this invention, only a part of the gases passing through the hydrogenation vessel are drawn off for treatment, and are then returned to the inlet of the hydrogenation vessel or to another hydrogenation vessel. The portion of gas withdrawn is passed through a chamber containing a catalyst such as an iron compound to remove the sulphur, or other compounds to remove the carbon dioxide and hydrocarbons.

302,759. Aliphatic Ketones, Process for the Production of. Holzverkohlungs-Industrie Akt.-Ges., and K. Roka, Konstanz, Baden, Germany. Application date, October 18, 1927.

Aliphatic ketones, particularly acetone, are obtained from primary aliphatic alcohols with two or more carbon atoms in the molecule such as ethyl alcohol, their aldehyde derivatives such as acetaldehyde, their aliphatic ester derivatives such as ethyl acetate, or mixtures of these with other derivatives of the alcohols by treating at 250–650° C. with water vapour in the presence of a catalyst consisting of oxygen compounds of heavy metals. Oxides of iron, manganese, copper, etc., may be used with a promoter such as calcuim carbonate, calcium oxide, magnesium carbonate, etc., or magnesium oxide, and metals such as iron. A suitable catalyst consists of oxidised iron shavings on which calcium carbonate is deposited. The catalysts are activated by heating to 500° C. with oxygen or air, with or without water vapour. The activation should be effected at short intervals of time, before the activity of the catalyst has fallen off. The regeneration of the catalyst may be effected with water vapour alone, particularly when acetaldehyde is the initial substance. The hydrogen obtained in the reaction may be used for heating the reaction chamber.

302,772. Vat Dyestuffs of the Dipyrazolanthrone Series, Manufacture of. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 31, 1927.

These dyestuffs are obtained from compounds of the dipyrazolanthrone series having the general formula



in which R and R_1 represent hydrogen or a monovalent substituent, at least one being a hydrogen atom. A compound of this series is heated to 100–200° C. with an aldehyde in the presence of phosphorus, antimony or aluminium chloride, preferably in the presence of a diluent. The halogenated derivatives of the above series are described in Specification No. 235,919 (See The Chemical Age, Vol. XIII, p. 231). These dyestuffs give yellow to orange shades on cotton. Examples are given of the treatment of dipyrazolanthrone with benzaldehyde using different condensing agents, meta- or ortho-chloro-benzaldehyde, meta-nitrobenzaldehyde, and meta-hydroxybenzaldehyde; dichloro-dipyrazolanthrone and benzaldehyde; tetrabromo-dipyrazolanthrone and benzaldehyde; dipyrazolanthrone and paraformaldehyde or paraldehyde; monoethyl dipyrazolanthrone and para-formaldehyde.

302,770. New Ortho-oxy-azo Dyestuffs and an Intermediate Product, Manufacture of. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 28, 1927.

A new intermediate compound, 2 : 8-dioxynaphthalene 6-carboxylic acid, is obtained by sulphonating the 2 : 6-naphthol-carboxylic acid to obtain 2-naphthol-8-sulpho-6-carboxylic acid, which is then subjected to caustic alkali fusion. The 2 : 8-dioxy-naphthalene-6-carboxylic acid may be combined with aromatic ortho-oxy-diazo compounds to obtain ortho-oxy-azo dyestuffs. The products are blackish powders soluble in concentrated sulphuric acid to a reddish-bluish solution. The dyestuffs give fast brownish shades on wool. Examples are given of the production of 2 : 8-dihydroxy-naphthalene-6-carboxylic acid, and its combination with diazotised 4-chloro-2-amino-phenol, 4-nitro-2-amino-phenol, paranitro-ortho-amino-salicylic acid, picramic acid, and others.

302,773. Azo Dyestuffs and Intermediate Products, Manufacture of. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 31, 1927.

Arylides of 2-arylamino-8-naphthol 6-carboxylic acids are obtained by sulphonating 2 : 6-naphthol-carboxylic acid, separating the 8-sulphonic acid and transforming it by alkali fusion into 8-hydroxy-2-naphthol-6-carboxylic acid, heating this with a primary arylamine in the presence of a condensing agent to obtain 2-arylamino-8-naphthol-6-carboxylic acids, which are converted into their arylides by heating with an arylamine and a dehydrating agent in an indifferent diluent. Examples are given of the production of 2-phenylamino-8-naphthol-6-carboxylic acid and its conversion into the anilide, para-anisidide, and β-naphthalide. Azo dyestuffs are obtained by combining these arylides with diazo bodies obtained from 3-chloraniline, 5-nitro-2-toluidine, ortho-amino-azotoluene, orthophenetol-azo-α-naphthylamine, 4-chloro-2-toluidine, 4-chloro-2-nitraniline, 2 : 5-dichlor aniline, 4 : 4^1-diamino-diphenylamine, and dianisidine. Some examples of these dyes are given.

302,965. Azo Dyestuffs, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 22, 1927.

These dyestuffs are obtained by combining a 2-aminobenzene-1-carboxylic acid sulphonamide or a derivative or substitution product with a coupling component, the shade depending on the coupling component. The azo dyestuff may be treated with sodium dichromate or copper sulphate to obtain products which are particularly suitable for the fast dyeing of animal fibres in an acid bath. Examples are given of the treatment of 2-aminobenzene-1-carboxylic-acid-5-sulpho-2-^{1}anisidide with 1-hydroxynaphthalene-5-sulphonic acid or 2-phenylamino-8-hydroxy-naphthalene-6-sulphonic acid, 2-aminobenzene-1-carboxylic-acid-5-sulphonanilide with the methyl-pyrazolone from 2-amino-1-hydroxybenzene-4-sulpho-6-carboxylic acid, 2-aminobenzene 1-carboxylic-acid-5-sulphonamide with 1-acetyl-amino-8-hydroxynaphthalene-3 : 6-disulphonic acid, 2-aminobenzene-1-carboxylic acid-5-sulpho-4^1-toluidide with 2-hydroxynaphthalene-8-sulphonic acid, or 1-hydroxynaphthalene-4-sulphonic acid, or 2-hydroxynaphthalene-6-sulphonic acid, or 3-methyl-1-(4^1-sulphophenyl)-5-pyrazolone 2-aminobenzene-1-carboxylic acid-5-sulphonamide with 2-aminonaphthalene-7-sulphonic acid, and copper and chromium compounds of these.

303,093. Derivatives of Aromatic Amino-oxy and Polyamino Compounds, Process for the Manufacture of. I.G. Farbenindustrie Akt.-Ges Frankfort-on-Main, Germany, and A. Carpmael, London. Application date, June 23, 1927. Addition to 267,169 and 274,058. (See The Chemical Age, Vol. XVII, p. 242.)

Therapeutic compounds are obtained by converting an

amine of the benzene series containing more than two amino groups, or a derivative or substitution product into a more strongly basic polyamino derivative in which a newly-introduced alkylamino group is combined to the aromatic amino group through the medium of an aliphatic residue. Also by converting an amino-oxy compound or polyamine of the benzene series, or a derivative or substitution product, into a more strongly basic polyamino derivative in which a newly introduced alkyl amino group is combined to the aromatic amino group through the medium of a hydroaromatic residue. Other methods are given, together with some examples.

303,184. Vat Dyestuffs, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges, Frankfort-on-Main, Germany. Application date, June 27, 1927.

These products are obtained by subjecting 2 : 2¹-dimethyl-ms-benzdianthrone or its derivatives to the influence of alkaline condensing agents such as sodium carbonate, sodium acetate, caustic potash, etc., preferably in a solvent. Similar dyestuffs are obtained from 2 : 2¹-dimethyl-ms-naphtho-dianthrones. The products may be treated with acid condensing agents such as aluminium chloride or may be dissolved in concentrated sulphuric acid and subjected to the action of light or oxidising agents to obtain further dyestuffs. The above dyestuffs can be halogenated to obtain other dyestuffs, and the properties of the halogenated dyestuffs can be improved by introducing different halogens and by simultaneous condensation. A large number of examples are given.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—274,058 (I.G. Farbenindustrie Akt.-Ges. and A. Carpmael) relating to alkylamino-alkylamino derivatives of aromatic compounds, see Vol. XVII, p. 242 ; 275,258 (I.G. Farbenindustrie Akt.-Ges.) relating to azo dyestuffs, see Vol. XVII, p. 331 ; 277,715 (R. B. Goldschmidt and S. Coulier) relating to nitrogenised metallic compounds, see Vol. XVII, p. 467 ; 278,689 (Goodyear Tire and Rubber Co.) relating to vulcanisation accelerators, see Vol. XVII, p. 536 ; 279,419 (N. Caro and A. R. Frank) relating to calcium cyanamide, see Vol. XVII, p. 579 ; 280,945 (Soc. of Chemical Industrie in Basle) relating to stable diazo compounds, see Vol. XVIII, p. 85 ; 290,179 (Soc. of Chemical Industry in Basle) relating to dyestuffs, see Vol. XIX, p. 35 ; 291,462 (Metropolitan Vickers Electrical Co., Ltd.) relating to non-ferrous alloys, see Vol. XIX, p. 23 (Metallurgical Section) ; 299,473 (I.G. Farbenindustrie Akt.-Ges.) relating to oxidation of leuco compounds of the triaryl-methane series, see Vol. XIX, p. 642.

International Specifications not yet Accepted

301,093. Hydrocyanic Acid. A. R. Frank, 138, Halensee, Berlin, and N. Caro, 8, Budapesterstrasse, Berlin. International Convention date, November 24, 1927. Addition to 282,379.

The compounds of alkaline earth metals employed in preparing hydrocyanic acid as described in specification 282,379. (See The Chemical Age, Vol. XVIII, p. 183) are replaced by zinc compounds.

301,096. Dyes. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, November 24, 1927.

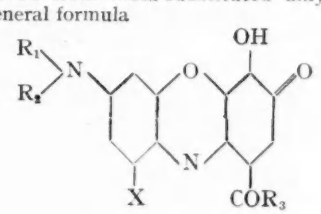
A diazotized dichloraniline is coupled with a 1-aryl-3-methyl-5-pyrazolone-sulphonic acid in which the aryl nucleus contains at least one halogen atom. Monoazo dyes are obtained giving yellow shades on silk and wool.

301,311. Dye Intermediates. I.G. Farbenindustrie Akt. Ges., Frankfort-on-Main, Germany. International Convention date, November 26, 1927.

A carboxylic acid chloride or anhydride and aluminium chloride are treated with a polyhalogen naphthalene with or without a diluent to obtain monoketones. Examples include the preparation of 1 : 4-dichloro-8-benzoyl-naphthalene, 8-benzoyl-1 : 5-dichloro-naphthalene, 1 : 4-dichloro-8- (*p*-chlorobenzoyl)-naphthalene, 1 : 4-dichloro-8-(α-naphthoyl)-naphthalene.

301,329. Dyes. Durand and Huguenin Akt.-Ges., 40, Fabricstrasse, Basle, Switzerland. International Convention date, November 26, 1927.

Products suitable for use in discharge printing are obtained by converting into derivatives in the usual manner, gallocyanines derived from meta-substituted alkylanilines, and having the general formula



where R_1 represents alkyl, R_2 represents hydrogen or alkyl, R_3 represents OH, NH_2, NH-aryl, or O-alkyl, and X represents a substituent such as CH_3 or halogen. In an example, the gallocyanine from nitrosodiethyl-*m*-toluidine and gallamide is treated with aniline in presence of dinitrobenzene and alcohol to obtain the anilido compound, and the product is sulphonated by heating with oleum. Other examples are given.

301,387. Fertilisers. Stockholms Superfosfat Fabriks Aktiebolag, 4, Kornhamstorg, Stockholm. International Convention date, November 28, 1927.

A mixture of potassium salt, phosphoric acid, and nitric or sulphuric acid is treated in thin layers in a worm conveyor with gaseous ammonia to obtain a mixed fertiliser.

301,395. Cracking Oils. F. Hoffmann, 39, Auenstrasse, Breslau, and C. Wulff, 22, Maxstrasse, Breslau, Germany. International Convention date, November 27, 1927.

A catalyst for use in cracking oils consists of a halogenide of boron, or an addition or substitution product.

301,423. Dyes. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 29, 1927.

A non-nitrated, *o*-diazophenol sulphonic acid or a halogen derivative is combined with 2-naphthylamine-3-carboxylic acid to obtain monoazo dyes. Green shades are obtained when chromed on the fibre.

301,486. Fertilizers. Kungstdünger-Patent-Verwertungs Akt.-Ges., Glarus, Switzerland. (Assigness of F. G. Liljenroth, 12, Danderydsgatan, Stockholm). International Convention date, December 1, 1927.

Calcium sulphate is treated with ammonia and carbon dioxide, to obtain calcium carbonate and ammonium sulphate. Some of the latter is left with the calcium carbonate, which is treated with nitric acid to obtain a mixture of calcium and ammonium nitrates.

Latest Notifications.

304,298. Process for the manufacture of azo dyestuffs and chromed derivatives thereof. Compagnie Nationale de Matières Colorantes et Manufactures de Produits Chimiques du Nord Réunies, Etablissements Kuhlmann. January 19, 1928.

304,585. Manufacture of metal alcoholates. Wacker Ges. Für Elektro-Chemische Industrie Ges, Dr. A. January 21, 1928.

304,308. Process of increasing the speed of reaction in the production of sulphuric acid from sulphur dioxide-containing gases in the presence of nitrogen-oxygen compounds. Metallges. Akt.-Ges. January 19, 1928.

304,589. Colloidal mono-sodium tetraiodophenolphthalein. National Aniline and Chemical Co., Inc. January 21, 1928.

304,280. Manufacture of basic nitro-derivatives of mesoamino-acridine. I.G. Farbenindustrie Akt.-Ges. January 18, 1928.

304,315. Kinematograph projection apparatus. I.G. Farbenindustrie Akt.-Ges. January 20, 1928.

304,207. Manufacture of artificial rubber. I.G. Farbenindustrie Akt.-Ges. January 16, 1928.

304,214. Process for producing a drench for skins. I.G. Farbenindustrie Akt.-Ges. January 16, 1928.

304,595. Benzole separators. Linnmann, Jun., W. January 21, 1928.

304,245. Manufacture of vat-dyestuffs and intermediate products. Soc. of Chemical Industry in Basle. January 17, 1928.

304,280. Method for the production of granular aluminium oxide. Blanc, G. A. January 18, 1928.

304,293. Photographic cameras. I.G. Farbenindustrie Akt.-Ges. January 18, 1928.

304,294. Process of drenching lined unhaired hides or skins. I.G. Farbenindustrie Akt.-Ges. January 18, 1928.

304,326. Process for the manufacture of water-insoluble azo dyestuffs. I.G. Farbenindustrie Akt.-Ges. January 20, 1928.

304,608. Manufacture of mordants and application thereof. Oranienburger Chemische Fabrik Akt.-Ges. January 19, 1928.

304,612. Process for the manufacture of artificial masses. I.G. Farbenindustrie Akt.-Ges. January 20, 1928.

304,613. Manufacture of dyestuffs of the anthanthrone series. Casella and Co., Ges., L. January 21, 1928.

Specifications Accepted with Date of Application

275,672. Titanium and like compounds, Preparation of. J. Blumenfeld. August 9, 1926.

279,070. Acetic anhydride, Manufacture of. Consortium für Elektrochemische Industrie Ges. October 18, 1926.

281,611. Cyanamides of the alkaline earth metals and magnesium, Production of. N. Caro and A. R. Frank. December 2, 1926. Addition to 279,812.

282,750. Hardening substances of iron, steel, and other ferro magnetic materials, Method and apparatus for. Eisen- U. Stahlwerk Hoesch Akt.-Ges., and W. Heidenhain. December 28, 1926.

282,772. Dissolving and purifying materials containing alumina, applicable also to other ores. M. Buchner. December 24, 1926.

287,178. Substituted thioglycollic acids, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 18, 1927. Addition to 281,290.

290,997. N-oxyethyl- derivatives of 4-amino-1-oxybenzene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 23, 1927. Addition to 280,873.

294,197. Roasting and/or sintering ores and the like, Apparatus for. Compagnie des Metaux Overpelt-Lommel. July 20, 1927.

296,048. Contact sulphuric acid process. Selden Co. August 24 1927.

296,071. Catalytic oxidation of organic compounds. Selden Co. August 26, 1927.

297,029. Substituted guanidines, Process for the manufacture of Schering-Kahlbaum Akt.-Ges. September 12, 1927.

303,760. Decomposing salts of complex hydrofluoric acids. A. F. Meyerhofer. July 28, 1927.

303,761. Hydrocarbons of low boiling point, Production of —from those of high boiling point. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 3, 1927.

303,772. Aliphatic anhydrides, Manufacture of. British Celanese, Ltd., H. Dreyfus, and C. I. Haney. July 7, 1927. Addition to 256,663.

303,813. Introducing sulphocyanide groups into organic compounds, Process for. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) September 5, 1927.

303,916. Mixed fertilisers. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 12, 1927.

303,917. Sulphonic acids, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 12, 1927.

303,984. Electrolytic manufacture of metallic powders. H. Wade. (*Soc. Anon. Trefileries et Laminoirs du Havre, Anciens Etablissements L. Weiller, Soc. Co-operative de Rugles, et la Canalisation Electriques Reunis.*) December 3, 1927.

303,998. Olefines and diolefines, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 14, 1927.

304,000. Hydrogenating open chains containing nitrogen in unsaturated union. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) December 20, 1927.

304,052. Copper sulphate, Manufacture of. Hungaria Mutragya Kensaves Vegyi Ipax Reszveny Tarsasag, and L. Deutsch. February 10, 1928.

304,053. Electrolysis of ferrous chloride. S. I. Levy and G. W. Gray. February 10, 1928.

Applications for Patents

Bakelite Corporation. Manufacture of phenol resins. 2,144. January 22. (Canada, November 26, 1928.)

Bleachers' Association, Ltd. Dyeing. 2,276. January 23.

Cassella and Co., Ges., L. Manufacture of dyestuffs. 2,065. January 21. (Germany, January 21, 1928.)

Chemische Industrie Akt.-Ges., and Meyer, H. Production of dried superphosphate. 2,357. January 23. (Germany, January 24, 1928.)

Coley, H. E. Production of zinc white. 1,994. January 21.

Coley, H. E., and Kekwick, L. O. Production of hydrocarbons. 1,995. January 21.

Dandridge, A. G., Drescher, H. A. E., Scottish Dyes, Ltd., and Thomas, J. Manufacture of chemical products. 2,497. January 24.

Fairweather, D. A. W., Scottish Dyes, Ltd., and Thomas, J. Production of intermediates for vat-dyestuffs. 2,380. January 23.

Fairweather, D. A. W., Scottish Dyes, Ltd., and Thomas, J. Production of colouring matters, etc. 2,658. January 25.

Fletcher, W. B., McAulay, J., and Wheeler, T. S. Production of cyanides. 2,626. January 25.

Fletcher, W. B., McAulay, J., and Wheeler, T. S. Carrying out chemical reactions. 2,627. January 25.

Flint, C. F. V. Containers of aluminium, etc. 1,997. January 21.

Harvey, P. P., and Holford, H. J. Low temperature distillation of carbonaceous materials. 2,100. January 22.

Horsley, G. F., and Imperial Chemical Industries, Ltd. Isopropyl alcohol. 2,562. January 25.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of viscous oils. 2,003. January 21.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of ammonia. 2,004. January 21.

I.G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Manufacture of azo dyestuffs. 2,342. January 23.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of insulated articles. 2,486. January 24.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of waterproof sheet materials. 2,487. January 24.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of resistant porous sheets. 2,488. January 24.

I.G. Farbenindustries Akt.-Ges. and Johnson, J. Y. Manufacture of elastic, etc., hollow articles. 2,615. January 25.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Pest-destroying agents. 2,732. January 26.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Low-temperature carbonisation. 2,733. January 26.

I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial masses. 2,064. January 21. (Germany, January 20, 1928.)

I.G. Farbenindustrie Akt.Ges. Continuous production of fused caustic alkalis. 2,179. January 22. (Germany, February 29, 1928.)

I.G. Farbenindustrie Akt.-Ges. Making bands of artificial fibres. 2,344. January 23. (Germany, January 23, 1928.)

I.G. Farbenindustrie Akt.-Ges. Packing for Röntgen photographic materials. 2,504. January 24. (Germany, February 3, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of basic phenol alkyl ethers. 2,517. January 24. (Germany, January 25, 1928.)

I.G. Farbenindustrie Akt.-Ges. Attachment for kinematograph films. 2,622. January 25. (Germany, January 25, 1928.)

I.G. Farbenindustrie Akt.Ges. Process of dyeing cellulose esters. 2,623. January 25. (Germany, January 25, 1928.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of finely divided active carbon. 2,643. January 25. (Germany, January 26, 1928.)

I.G. Farbenindustrie Akt.-Ges. Process for printing with vat dyestuffs. 2,624. January 25. (Germany, January 26, 1928.)

I.G. Farbenindustrie Akt.-Ges. Immunising agents for wood, etc. 2,641. January 25. (Germany, January 25, 1928.)

I.G. Farbenindustrie Akt.-Ges. Reserving wool in dyeing. 2,642. January 25. (Germany, January 25, 1928.)

I.G. Farbenindustrie Akt.Ges. Manufacture of dyes. 2,753. January 26. (Germany, January 26, 1928.)

Imperial Chemical Industries, Ltd. Preparation of leather cloth etc. 2,379. January 23.

Imperial Chemical Industries, Ltd. Water-gas generators. 2,563, 2,564, 2,565. January 25.

Imperial Chemical Industries, Ltd. Production of hydrogen. 2,566. January 25.

Imperial Chemical Industries, Ltd., and Smith, C. C. Production of solid calcium nitrate. 2,567. January 25.

Imperial Chemical Industries, Ltd. Production of cyanides. 2,626. January 25.

Imperial Chemical Industries, Ltd. Carrying out chemical reactions. 2,627. January 25.

Imperial Chemical Industries, Ltd. Resinous compositions. 2,675. January 25.

Kunstharzfabrik Dr. F. Pollak Ges. and Reddie, L. N. Production of artificial compositions from condensation solutions of urea, etc. 2,403. January 23. (December 11, 1928.)

Newport Co. Purification of benzanthrones. 2,633. January 25. (United States, February 6, 1928.)

Oranienburger Chemische Fabrik Akt.-Ges. Manufacture of mordants, etc. 2,059. January 21. (Germany, January 19, 1928.)

Piette, O. Production of ammonium sulphate. 2,670. January 25.

Schering-Kahlbaum Akt.-Ges. Manufacture of alkylene-substituted phenols. 2,215. January 22. (Germany, January 25, 1928.)

Schering-Kahlbaum Akt.-Ges. Manufacture of organo-metallic compounds. 2,516. January 24. (Germany, January 25, 1928.)

Scottish Dyes, Ltd., and Thomas, J. Production of condensation products. 2,381. January 23.

Urbain, E. Process for preparation of phosphate of potash, etc. 2,312. January 23. (France, December 22, 1928.)

U.S. Industrial Alcohol Co. Manufacture of cellulose acetate. 2,162. January 22. (United States, February 24, 1928.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder. £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¼d. to 6¾d. per lb. Crude 60's, Jan., 1s. 11d. per gall.; Feb./Mar., 1s. 10½d. per gall.

ACID CRESYLIC 99/100.—2s. 5d. to 2s. 10d. per gall. 97/99.—2s. 2d. to 2s. 3d. per gall. Pale, 95%, 1s. 11d. to 2s. per gall. Dark, 1s. 9d. to 1s. 10d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—7¾d. to 8d. per gall. Unstrained, 7¼d. to 7½d. per gall.

BENZOLE.—Prices at worls: Crude, 10d. to 10½d. per gall.; Standard Motor, 1s. 4d. to 1s. 4½d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 5d. to 1s. 9d. per gall. Firm. Pure, 1s. 10d. to 2s. 2d. per gall.

XYLOL.—1s. 3d. to 1s. 11d. per gall. Pure, 1s. 6d. to 1s. 7d. per gall.

CREOSOTE.—Cresylic, 20/24%, 8¾d. per gall.; Heavy, 7d. to 7½d. per gall. Middle oil, 5¾d. to 6¼d. per gall. Standard specification, 5¼d. to 5½d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent, 90/160, 1s. 1½d. to 1s. 2½d. per gall. Solvent, 95/160, 1s. 2d. to 1s. 6d. per gall. Solvent 90/190, 11d. to 1s. 3d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 35s. to 37s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 4s. 3d. to 6s. 6d. per gall. 90/180, 2s. 3d. to 3s. per gal. Heavy, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8¾d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8¾d. per lb.

o-CRESOL 29/31° C.—5¼d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITHROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6¼d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4⅜d. to 5⅝d. per lb.

LAMP BLACK.—£32 10s. per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£23 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£10 to £12 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 10d. to 7s. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4½d. to 2s. 5d. per lb.

ACID, BENZOIC, B.P. 2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carraige paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. 1d. to 2s. 2d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 6d. to 1s. 7d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. per lb.
BISMUTH CITRATE.—9s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 9d. per lb.
BISMUTH SUBNITRATE.—8s. 3d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 9d. per lb.
BISMUTH OXIDE.—12s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. to 2s. 3d. per lb.; potassium, 1s. 8½d. to 1s. 11½d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—B.P., 1s. 3d. to 1s. 4d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 5½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—1s. 11d. to 2s. 2d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 9d. per lb.; potassium, 3s. per lb.; sodium, 2s. 11d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb.; U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 22s. 3d. per lb. net; Synthetic, 11s. to 12s. 6d. per lb.; Synthetic detached crystals, 11s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 6d. per lb.
METHYL SULPHONAL.—8s. 9d. to 9s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 5d. to 2s. 8d. per lb.
PHENAZONE.—3s. 9d. to 4s. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—96s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 6d. to 2s. 9d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 3d. to 2s. 6d. per lb., B.P.C. 1923—2s. 8d. to 2s. 9d. per lb. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—10s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 5½d. to 1s. 7d. per lb. Crystal, 1s. 6½d. to 1s. 8d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10s. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 12s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—6s. 6d. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 6d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—8s. 6d. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—14s. per lb.
GERANIOL (PALMAROSA).—20s. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—16s. per lb.
LINALOL.—Ex Bois de Rose, 13s. per lb. Ex Shui Oil, 9s. 3d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 17s. 6d. per lb. Ex Shui Oil Linalol. 10s. 6d. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. per lb.
RHODINOL.—45s. per lb.
SAFROL.—1s. 8d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—23s. per lb.
BOURBON GERANIUM OIL.—21s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. per lb.
CINNAMON OIL LEAF.—7s. per oz.
CASSIA OIL, 80/85%.—6s. 9d. per lb.
CITRONELLA OIL.—Java, 2s. 2d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 10½d. per lb.
CLOVE OIL (90/92%).—11s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—2s. per lb.
LAVENDER OIL.—Mont Blanc, 48/50%, Esters, 16s. 9d. per lb.
LEMON OIL.—14s. 9d. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—21s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—13s. per lb.
PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 15s. 6d. per lb.; Japanese, 8s. per lb.
PETITGRAIN.—8s. 6d. per lb.
SANDALWOOD.—Mysore, 28s. per lb.; 90/95%, 18s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, January 31, 1929.

TRADE has been moderately active and there is little of special feature to report. Markets on the whole display great steadiness, whilst in one or two products there is continued short supply. Consumers are placing their orders for forward requirements much more readily, which indicates greater confidence in present prices. Export trade is fairly satisfactory and tends to broaden.

General Chemicals

ACETONE.—The position of supplies remains unchanged, there being little available for near delivery, and price is firm at £77 to £85 per ton according to quantity.

ACID ACETIC.—The usual day to day trade is in evidence at unchanged prices of £36 10s. to £37 10s. for 80%.

ACID CITRIC.—Rather quieter trading conditions are reported with price now steady at about 2s. 2d. to 2s. 3d., less 5% for early delivery.

ACID FORMIC.—Demand is rather slow at present, and price is unchanged at £43 for 85%.

ACID LACTIC.—Unchanged at £43 for 50% weight pale qualities, at which figure a moderate trade is maintained.

ACID OXALIC.—A good trade is passing at £30 10s. to £32 10s. for usual crystal quality.

ACID TARTARIC.—A steady trade is passing at unchanged prices of 1s. 4½d. to 1s. 4¾d., less 5%.

ALUMINA SULPHATE.—A brisk demand continues, with prices very firm at £7 to £8, and the product is in rather short supply for early delivery.

AMMONIUM CHLORIDE.—An active demand continues for dog tooth crystals, and supplies for near delivery are difficult to obtain. Price holds firm and other grades of the product are in good demand.

ARSENIC.—A firm tendency has set in, and prices are a shade higher with inquiry brisker.

BARIUM CHLORIDE is a bright market with demand active for early and forward delivery. Near supplies are scarce, and price is firm at £11 to £11 10s.

CREAM OF TARTAR.—Demand continues rather slow, and price remains steady at £95 to £97 10s. for 99/100% B.P.

COPPER SULPHATE.—Further advances are reported, and demand continues active. Nominal price about £28, but early delivery in all cases cannot be given.

FORMALDEHYDE.—Product is in good demand and price remains firm at £39.

LEAD ACETATE.—A steady trade is passing at £42 10s. for white and £1 per ton less for brown.

LEAD NITRATE.—Unchanged at £36 per ton delivered U.K.

LIME ACETATE.—Grey quality scarce and quoted at about £18.

LITHOPONE.—In steady demand at £19 15s. to £21 per ton.

METHYL ACETONE.—A satisfactory business is offering, and prices hold firm at £58 to £60 per ton.

METHYL ALCOHOL.—Firm conditions continue and inquiry is active.

POTASH PERMANGANATE.—No change in price is noticed which remains firm at 5½d. per lb., and inquiry is a little better.

POTASH CARBONATE AND CAUSTIC.—A small trade is passing, and prices are unchanged.

POTASH CHLORATE.—Steady, and in fair demand at about £28 to £30 per ton.

POTASH PRUSSIATE.—A better demand has been received with prices firm at £63 10s. to £65 10s. There are only small stocks available for near delivery.

SODIUM ACETATE.—A brisk trade is passing, and price is slightly firmer at £21 5s. to £22 5s. The meagreness of supplies continues.

SODIUM BICHROMATE.—Demand is good and price is firm at the fixed price of 3½d. per lb. with rebate for contracts.

SODIUM CHLORATE.—Demand is improving, and market continue steady at £25 per ton.

SODIUM HYPOSULPHITE.—A steady trade is passing at unchanged prices.

SODIUM NITRITE.—Steady at £20, with a fair demand.

SODIUM PHOSPHATE.—In fair demand at £12 for dibasic and £17 10s. for tribasic.

SODIUM PRUSSIATE.—In good request at firm rates of 4½d. to 5½d. per lb., according to quantity.

SODIUM SULPHIDE.—Unchanged and in normal request.

TARTAR EMETIC.—Small demand at 10½d. to 11d. per lb.

ZINC SULPHATE.—Steady market at £12 per ton.

Coal Tar Products

There is little change in prices to report in the coal tar products market from last week, although the slightly better tone is maintained.

MOTOR BENZOL remains scarce, the price being about 1s. 7½d. to 1s. 8d. per gallon, f.o.r. maker's works.

SOLVENT NAPHTHA is unchanged at 1s. 1½d. per gallon, f.o.r.

HEAVY NAPHTHA is quoted at 1s. 1d. to 1s. 1½d. per gallon on rails.

CREOSOTE OIL is unchanged, at 5¼d. per gallon on rails in the North and at 6d. per gallon in London.

CRESYLIC ACID remains weak, the 98/100% quality being obtainable at about 1s. 10d. per gallon, and the dark quality 95/97% at 1s. 8d. per gallon f.o.b.

NAPHTHALENES.—The firelighter quality is quoted at about £4 10s per ton, the 74/76 quality at £5 per ton, and the 76/78 quality at £6 to £6 5s. per ton.

PITCH remains unchanged, at 35s. to 37s. per ton, f.o.b.

Nitrogen Products

Sulphate of Ammonia.—There is nothing fresh to report. A few colonial orders have been received, and business is still being done at the scale prices.

Home Trade.—The demand this week has been very good. Many country merchants are continuing to send in orders for stock purposes, but a number of inquiries for immediate delivery have been received.

Nitrate of Soda—There is nothing to report.

Latest Oil Prices

LONDON, JANUARY 30.—LINSEED OIL was firm and 2s. 6d. to 5s. per ton higher. Spot, ex mill, £29 10s.; February-April, £28 12s. 6d.; May-August, £28 17s. 6d.; and September-December, £29 5s., naked. RAPE OIL was steadier at a recovery of 10s. per ton. Crude extracted, £42; and technical refined, £44. COTTON OIL was quiet. Egyptian crude, £30; refined common edible, £35 10s.; and deodorised, £37 10s., naked, ex mill. TURPENTINE was quiet and unchanged. American, spot, 46s. 6d.; February-April, 47s. per cwt.

HULL, JANUARY 30.—LINSEED OIL.—Spot to April £28 10s.; May-August, £28 15s.; September-December, £29 per ton, naked. COTTON OIL.—Egyptian crude, spot (new) and January-February, £28 5s.; edible refined, spot and January-February, and technical, spot, £32; deodorised, spot, £34 per ton, naked. PALM KERNEL OIL.—Crude naked, 5½ per cent., spot, £36 15s. per ton. GROUNDNUT OIL.—Crushed-extracted, £37 10s.; deodorised, £41 10s. per ton. SOYA OIL.—Extracted and crushed, £31 10s.; deodorised, £35 per ton. RAPE OIL.—Crude-extracted, £41 5s.; refined, £43 5s. per ton, net cash terms, ex mill. TURPENTINE, CASTOR OIL, and COD OIL unaltered.

South Wales By-Products

SOUTH WALES by-product activities continue to be quiet and featureless. Pitch has a weak market and values are nominal round the 37s. per ton mark. Crude tar is slightly better round the 28s. to 32s. per ton makers' works mark, but road tar continues easy at from 12s. to 15s. per 40 gallons barrel. Refined tars continue to have a steady, but moderate call, with values unchanged. Coke oven tar is quoted at 7d. to 7⅜d. per gallon delivered, and gasworks tar at 6½d. to 7d. per gallon delivered. Crude naphthalene is quiet round the 80s. per ton mark, but whizzed is slightly better with values unchanged at 100s. per ton. Patent fuel and coke exports are slightly better, with values easier. Patent fuel, ex-ship Cardiff, 20s. to 21s. per ton; ex-ship, Swansea, 19s. to 19s. 3d. per ton. Coke, best foundry, 32s. 6d. to 36s. 6d.; furnace, 19s. to 21s.; and good foundry from 25s. to 32s. 6d. per ton. Oil imports over the last four ascertainable weeks amounted to 18,085,593 gallons.

Anæsthetic Ether

MAY AND BAKER, LTD., state that in consequence of the recommendations of the Anæsthetics Committee of the Medical Research Council and the Royal Society of Medicine and the necessary conditions of the Customs Authorities having been complied with, they are now able to send out our Baker's anæsthetic ether and Ether B.P. for anæsthesia, made solely from rectified spirit, which, being duty-free, will involve no higher charge than when made from methylated spirit as hitherto. This will result in the supplying of anæsthetic ether, absolutely free from methylic products, aldehydes, peroxides and other deleterious compounds, at less than a quarter of its former price when made from pure spirit. Besides the consequent economy resulting from the use of anæsthetic ethers of absolute purity, it will give anæsthetists the greatest confidence in employing ether for anæsthesia. Industrial ethers are unaffected and will still be made from methylated spirit.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, January 30, 1929.

DURING the past week the heavy chemical market has, if anything, been more active than for some little time. Prices remain steady and the proportion of export inquiry is good.

Industrial Chemicals

ACETONE, B.G.S.—£77 10s. to £85 per ton, ex wharf, according to quantity. There is still little available for immediate delivery.

ACID ACETIC, 98/100%.—Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton; powder, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARPOLIC, ICE CRYSTALS.—Quoted 6⅜d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC B.P. CRYSTALS.—Rather easier and quoted 2s. 2½d. per lb., less 5% ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80°.—Quality £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton, for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex wharf. Offered for prompt shipment at 1s. 4d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—On offer at £5 10s. per ton, c.i.f. U.K. ports. Spot material quoted £5 15s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £8 7s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Crystal meal quoted £8 10s. per ton, ex store.

AMMONIA ANHYDROUS.—Quoted 9½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K.

ANTIMONY OXIDE.—Quoted £36 per ton, c.i.f. U.K. ports. Offered for prompt delivery at about £39 per ton, ex store.

ARSENIC, WHITE POWDERED.—Quoted £18 10s. per ton, ex wharf, prompt despatch from mines. Spot material on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—On offer from the Continent at £10 5s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4 ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price £4 5s. to £4 15s. per ton, according to quality and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

COPPER SULPHATE.—Steady and price about £25 15s. per ton, ex wharf.

FORMALDEHYDE, 40%.—Some spot material available at about £37 10s. per ton, ex quay.

GLAUBER SALTS.—English material unchanged at £5 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—On offer at £29 10s. per ton, ex store.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton. Brown on offer about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P., quoted 1s. 4d. per gallon less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports with an allowance of 2½% for minimum 2½ tons to be taken during six months.

POTASSIUM CARBONATE, 96/98%.—Offered from the Continent £25 10s. per ton, c.i.f. U.K. Spot material quoted £26 10s. per ton, ex store.

POTASSIUM CHLORATE, 99¾/100%, POWDER.—Quoted £22 15s. per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Offered for prompt shipment from the Continent at 6⅞d. per lb., ex wharf. Spot material quoted 7d. per lb., ex store.

SODA CAUSTIC.—Powdered, 98/99%, now £17 10s. per ton in drums, £18 15s. per ton in casks; solid, 76/77%, £14 10s. per ton in drums; 70/72%, £14 2s. 6d. per ton in drums, all carriage paid buyers' station, minimum 4-ton lots, for contract 10s. per ton less.

SODIUM ACETATE.—On offer for prompt delivery at about £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Price during first six months of this year 3¾d. per lb., delivered U.K. or c.i.f. Irish ports less 2½% for contract of minimum 2½ tons.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton. Extra light soda ash, £7 13s. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Price now £10 10s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, usual extras for small quantities and refined qualities.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 per ton; broken, 60/62%m £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra. Prices for this year unchanged.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton; ex store.

ZINC CHLORIDE, 98%.—British material now quoted £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Institute of Chemistry Pass List

THE pass list for the January examinations, 1929, of the Institute of Chemistry, in general chemistry for the Associateship, is as follows: Allport, N. L. (Northern Polytechnic, London); Bott, E. C. B. (Loughborough College, and The Technical College, Derby); Hutcheson, W. B. (Royal Technical College, Glasgow); Moore, G. (College of Technology, Manchester); Stapley, W. J. (West Ham Municipal College, London); and Taffs, B. (The University, Liverpool).

Examinations for the Associateship and Fellowship of the Institute will be held from April 8 to 13, and April 15 to 20. The list of entries will close on Monday, February 11. Forms of application and full particulars can be obtained from the Registrar.

A Correction

MR. G. J. GREENFIELD, M.Sc., A.R.C.S., writes us as follows:—"I notice that you have kindly made a reference to the fact that I have been appointed works manager of Thorncliffe Coal Distillation, Ltd., in your issue of January 19. It is not correct to say that I am succeeding Mr. Ray as president of the Coke Oven Managers' Association. Mr. Ray was appointed this year as president of the Association, and it is true that I am succeeding him as works manager of Thorncliffe Coal Distillation, Ltd., but the presidency of the Coke Oven Managers' Association automatically falls upon the vice-president, Mr. A. H. Middleton."

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, January 31, 1929.

Patchy conditions continue to prevail in the chemical market locally. Considering the state of the Lancashire cotton trade and the textile trades generally, contract deliveries of chemical products are not unsatisfactory, although there is room for expansion in this respect. For the most part, although there is a fair volume of enquiry about, transactions in the spot market relate to comparatively limited quantities.

Heavy Chemicals

A quiet trade is passing in hyposulphite of soda at steady prices, the commercial grade being quoted at £9 per ton, and the photographic at from £15 5s. to £15 10s. Business in chlorate of soda is rather slow and, except for indications of prices easing off a little, this section presents no special feature; offers to-day are at round 2¾d. per lb. The demand for caustic soda keeps up at about its recent level, with contract quotations ranging from £12 15s. to £14 per ton, according to quality. With regard to phosphate of soda, a moderate inquiry has been reported this week at £12 5s. per ton. Bichromate of soda keeps steady and fair sales are being effected on the basis of 3½d. per lb. Alkali at round £6 per ton and bicarbonate of soda at £10 10s. are well held in both instances, and there is a quietly steady call for these materials. On the whole, sales of salt cake are on somewhat quiet lines, with offers varying from about £2 10s. to £2 15s. per ton, according to quantity. There has been little change in the position of prussiate of soda; a moderate business is going through at from 4½d. to 5¼d. per lb. Bleaching powder is steady at £7 10s. per ton for British makes, and a fair amount of inquiry is reported. With regard to sulphide of sodium, only a quiet trade is being done at the moment, but quotations are fully maintained at about £9 10s. per ton for the 60-65 per cent. concentrated solid quality, and £8 for the commercial grade.

Permanganate of potash is still in some what quiet demand at about 5½d. per lb. for the commercial material and 5¾d. for the B.P. Caustic potash continues firm at from £33 5s. per ton for prompt deliveries of one to five-ton lots, and a fair inquiry is reported in this section. There has been little alteration in the position of chlorate of potash, offers of which remain at round 3d. per lb., although the movement is on comparatively narrow lines. Yellow prussiate of potash is well held and a moderate trade is being done at from 6¾d. to 7¼d. per lb., according to quantity. Carbonate of potash is in quietly steady request, and values are about maintained at £26 5s. per ton. Bichromate of potash is well held up at 4½d. per lb., and a quietly steady business is being put through.

Sulphate of copper keeps very firm in sympathy with the continued rising tendency of the metal and from £27 15s. to £28 per ton, f.o.b., is about the current range of prices. There is still only a relatively small trade passing in the case of arsenic, although at from £16 5s. to £16 10s. per ton, at the mines, for white powdered, Cornish makes, quotations seem to be a shade less easy than they have been of late. There is a quiet demand about for nitrate of lead at £34 10s. per ton. The acetates are steady generally; white and brown acetates of lead are on offer at £40 and £39 to £39 10s. per ton, respectively, and grey and brown acetates of lime at £17 15s. and £9 per ton.

Acids and Tar Products

A quiet demand has been reported this week for tartaric acid at about 1s. 4¼d. per lb. There has been no further easing off in citric acid, offers of which to-day range from about 2s. 2d. to 2s. 3d. per lb. for spot parcels. Oxalic acid is steady and in moderate request at £1 12s. per cwt. Acetic acid continues to move off in fair quantities at steady prices, glacial being quoted at about £66 per ton, and 80 per cent. commercial at £36.

Among the by-products, pitch shows little change, a quiet business passing at about £1 15s. per ton, f.o.b. Creosote oil, however, still shows signs of weakness at 4½d. per gallon, naked, and the demand is comparatively poor. Crude 60's carbolic is in moderate demand at from 1s. 10d. to 1s. 11d. per gallon, and crystal steady and fairly active at 6¼d. per lb. f.o.b. A quiet trade is being done in solvent naphtha at 1s.1½d. per gallon.

The Distillation of Wood

Development and Prospects

The fourth meeting of the Nottingham Section of the Society of Chemical Industry was held on Wednesday, January 16, at Nottingham University College, Dr. F. L. Pyman, F.R.S., in the chair.

A paper was read by Mr. F. C. Conyers, F.I.C., on "The Distillation of Wood." The lecturer first gave a brief account of the early history of this process. Charcoal was used by the ancient races for fuel and for metallurgical purposes, while the Egyptians were able to recover fluid wood tar and pyroligneous acid, which they used for the embalming process. Towards the end of the eighteenth century, wood distillation was being carried on in several factories in England and Scotland, and about 1849 the first American plant was built and operated.

Mr. Conyers then gave a general account of the modern hard wood distillation process. The rapid development of the coal distillation industry introduced almost disastrous competition, but gave an enormous impetus to the production of acetic acid, wood naphtha and acetone.

Method of Working

Wood waste was loaded into steel cars holding about 2½ tons, and four cars were charged into the retort, a rectangular mild steel chamber in a brickwork furnace setting. The retort was fired usually with coal fuel, and had one or more outlets connected with copper condensers, having some form of tar separating device. After the completion of the reaction, the cars containing the hot charcoal were transferred to coolers, where they were sealed from the atmosphere for 24 hours.

The non-condensible gases were used in the retort furnaces, and the liquid condensate, containing tar and pyroligneous acid, was separated by mechanical means from the undissolved tar. The pyroligneous acid was then either neutralised with slaked lime and evaporated to dryness (when brown acetate of lime, containing 62–65 per cent. of calcium acetate, was produced), or again distilled and neutralised when a product known as grey acetate of lime was obtained, containing 80–85 per cent. of calcium acetate. The distillate from the neutralised pyroligneous acid was fractionated to obtain wood naphtha of Customs and Excise specification for denaturant, and so-called methyl acetone for solvent purposes.

Chemistry of Wood Distillation

Turning to the chemistry of the process, Mr. Conyers said that although much work had been done, our knowledge was still in an unsatisfactory condition. The water contained in the wood escaped first, with practically no gas, up to about 170° C. From 170° to 270° C. carbon monoxide and dioxide were evolved, and a certain amount of formic and acetic acid was formed together with small amounts of wood naphtha and tar. At about 270–280° C. the exothermic period was reached, which must be very carefully controlled; the temperature rose to 380–400°, and large quantities of hydrocarbons, acetic, etc. acids, wood naphtha and tar, were produced, and carbon was concentrated in the charcoal. The charcoal, when cooled in an atmosphere of hydrocarbons, would increase by 5–6 per cent. in carbon content.

The lecturer then discussed the yields obtained per ton of wood; he said that a recent list of products gave 171 chemical compounds, so that, remembering also the complexity and variable nature of the wood, an estimate of yields must, of necessity, be taken with reserve. A ton of English wood would yield 4–5 cwt. of charcoal, 3,500–4,500 cubic feet of wood gas, 3–3½ gallons of wood naphtha, 1–1½ cwts. of acetate of lime, and 7 gallons of undissolved tar. The charcoal, after treatment, had a great variety of uses, and was of a high fuel value. "Activated" charcoal was obtained by treating ordinary charcoal with steam, carbon dioxide and other things at a high temperature. Work had also been done in this country and elsewhere on the utilisation of the high calorific value and ease of gasification of charcoal, as a source of fuel for internal combustion engines, especially for use in countries where petrol was not easily obtainable. Wood gas consisted mainly of carbon dioxide, carbon monoxide and methane, and was used as a source of heat and power. The wood naphtha might be further fractionated for pure methyl alcohol. The mechanically separated tar contained valuable products.

Company News

FAIRY DYES.—A dividend of 3¼d. per share, less tax, is announced on the ordinary capital, equivalent to 12½ per cent. per annum for the period to November 30 last.

BEMBERG ART SILK CO.—The report for the year ended September 30 shows that the net profit increased by 1,150,000 marks to 4,270,000. The dividend is again 14 per cent.

BORAX CONSOLIDATED, LTD.—The directors have decided to recommend to the shareholders in general meeting the payment of a final dividend of 1s. per share (5 per cent.) less income tax at 4s. in the £ on the deferred ordinary shares of the company, making with the interim dividend paid in November last 7½ per cent. for the year ending September 30, 1928.

GAS, LIGHT AND COKE CO.—For the year ended December 31, 1928, the accounts show that the balance to the credit of the net revenue account will enable the directors to recommend a final dividend on the ordinary stock at the rate of £5 12s. per cent. per annum, making, with the interim at £5 10s. per cent. per annum, a total of £5 11s. per cent. for the year, the highest yet paid, carrying forward to next account the sum of £158,657. The final dividend for 1927 was at the rate of £5 1s. 4d. per cent. per annum on ordinary, making a total of £5 0s. 8d. per cent., when £121,577 was carried forward.

CANADA CEMENT.—The profits from operations for the year ended November 30 last, after making provision of $1,598,873 for depreciation of capital assets, were $3,074,900. After deducting bond interest $1,100,000, fire insurance reserve $152,950, reserve for extraordinary repairs and renewals $25,000, for cloth sacks outstanding $150,000, for industrial accidents $20,000, contingent reserve (for taxes, etc.) $230,000, preference stock sinking fund $2,077, and dividends on preference stock $1,365,000, there remains $29,873, which, with the surplus balance brought in, makes a total of $6,433,778 represented by 600,000 shares of no par value common stock out of an authorised issue of 750,000 shares.

Cellulose Acetate Silk Co.'s Statement

THE directors of the Cellulose Acetate Silk Co. have issued a circular dealing with statements that have appeared regarding the company. The circular states that "the only prospect of profit of any kind conceded to the promoters was the option on 600,000 deferred shares at 100 per cent. premium. This remained unexercised until last week, when the directors received notice in writing that it was exercised. At that time the option price was considerably more than the Stock Exchange quotation.

"The directors, instead of having unloaded the bulk of their holdings at the earliest possible moment, as alleged, have considerably increased them, and the total number of shares owned by them is now largely in excess of the number of shares originally owned by them."

The approximate position as at January 24, 1929, exclusive of the value of processes, licences and goodwill, is as follows:—

Assets: Freehold works at Lancaster (land and buildings at Messrs. Fuller, Horsey, Sons and Cassell's valuation, under date January 23, 1929, and the plant, machinery and installation at cost), £433,108; cash at bank, or at call, £615,641; debtors, £2,062; total, £1,050,811.

Liabilities: 950,007 ordinary shares of £1 each, £950,007; 1,485,000 deferred shares of 1s. each, £74,250; total, £1,024,257.

"The first unit for the making of four tons per day of acetate of cellulose is producing a quality of product equal to the best produced in the world, and it is believed at a lower cost than any other. This is the real basis of the business. It would clearly be inadvisable, in the interests of the shareholders themselves, to reveal further particulars. The directors, however, are entirely satisfied, both with the results already achieved and with the prospects opened up by the policy now being pursued.

"It will be seen that the ordinary shares are fully covered by conservatively valued assets, of which nearly 60 per cent. is in cash; and when the value of the patents and processes is taken into account, there are most satisfactory assets behind the deferred shares."

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C 2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to February 23, 1929.

HELISEN.

497,915. Class 3. Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers.—December 8, 1928.

UNDEN.

497,916. Class 3. Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers. December 8, 1928.

ADSORBOLATE.

497,725. Class 3. Chemical substances prepared for use in medicine and pharmacy. Thomas Morson and Son, Ltd., 47, Gray's Inn Road, London, W.C.1; fine chemical manufacturers.—December 4, 1928.

Solvent Extraction of Oil from Seeds

ALTHOUGH the process of solvent extraction has been known and in use for very many years, it is comparatively recently that its extended use has been developed in the vegetable oil industry, as an alternative to the expression of the oil from seeds by hydraulic pressure. All classes of oil seeds can be treated effectively by the solvent process, and both the oil and the residue can be guaranteed entirely free from any trace of the solvents used. Rose Downs and Thompson, Ltd., of Hull, well known as makers of solvent extraction plant, have sent us a pamphlet dealing with the subject, in which it is pointed out that the primary advantage offered by the solvent process is that, instead of leaving from 5 to 10 per cent. of oil in the residue, practically the whole of the oil can be removed from the seed. The residue from the solvent process is as little as ½ per cent., and although it is possible to extract all the oil, this latter procedure is not usually commercially economic.

The theory of solvent extraction is that when ground oleaginous seed is saturated with some suitable chemical solvent, the oil is dissolved by the solvent and can be drained off with it. The mixture is subjected to heat to evaporate the solvent, the vapour of which is condensed and used again. Benzine is the solvent chiefly employed in the vegetable oil industry. The process, briefly explained, consists of the following operations: After the preliminary preparation of the seed, the solvent is allowed to percolate the ground seed in an enclosed pan. The mixture of oil and solvent is drained into an evaporator, and the solvent driven off by heat, passing as vapour to condensers, where it liquifies. The residue in the form of meal is treated with steam to remove any remaining solvent, which is also condensed.

Rose Downs and Thompson, Ltd., have designed numerous large solvent extraction plants at work on vegetable oils in this country, for dealing with quantities up to 1,200 tons a week, and are in a position to advise as to what plant will function best in given circumstances; since it is obviously impossible to have a standard universal plant. In some instances a combination of pressing and solvent plants is employed, as, for example, to treat castor seed when a high quality medicinal oil is required. For this purpose, the medicinal oil is expressed by cold pressing in one of their "Premier" or cage type presses. The cakes from this first pressing are then broken up, and further treated in a solvent extracting plant, which extracts practically the whole of the remaining oil, less than 1 per cent. usually being left in the residue.

CO_2 Systems

The ALFITE CO_2 System is recommended as the reliable system for the protection of electrical risks and special hazards in the chemical industry

For particulars apply to:

Foamite Firefoam, Ltd.,

55-57, Gt. Marlborough St.,

LONDON, W.1

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

McCANN AND CO., LTD., 21, Cumberland Street, Liverpool, manufacturing chemists. (C.C., 2/2/29.) £26 12s. December 6.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

RADIUM MANUFACTURING CO., LTD., London, E.C., manufacturers of toilet preparations, etc. (M., 2/2/29.) Registered January 14, £50 debenture, to I. Cohen, 10, Spurstowe Road, Hackney; general charge.

SERRE (ACHILLE), LTD., London, E., dyers and cleaners. (M., 2/2/29.) Registered January 16, supplemental Trust Deed dated January 10, 1929, securing £50,000 debenture stock (in addition to amount secured by Trust Deed dated March 14, 1928); charged on property in Blackhorse Lane, Walthamstow, also general charge. *£150,000 debenture stock, £14,350 mortgages. April 4, 1928.

VIGZOL OIL REFINING CO. (LONDON), LTD. (M., 2/2/29.) Registered August 16, mortgage, to bank; charged on Roan Works, Greenwich, etc.

New Companies Registered

THE ATLAS ARTIFICIAL SILK PROCESSES, LTD.—Registered as a "public" company on January 16. Nom. capital, £1,000,000 in 5s. shares. To adopt agreements with the International Artificial Silk Co., Ltd., to acquire the exclusive rights in the "Brandwood" processes and patents referred to in the said agreements for the British Empire (except Canada) and the interest in such processes and patents for the other countries referred to in the first of the said agreements; to acquire certain freehold and leasehold lands, plant and machinery; to exploit and develop the above or other patents, inventions and processes; and to carry on the business of manufacturers of and dealers in artificial silk and other artificial fibres. A subscriber: N. Alexander, C.A., 22, Ashburn Place, London, S.W.7.

F. C. CALVERT AND CO., LTD., 43, Piccadilly, Manchester. Registered as a "private" company on January 26. Nom. capital, £100,000 in £1 shares. To acquire the business of a manufacturing chemist now carried on by C. W. Lowe as "F. C. Calvert and Co.," at Gibbon Street, Bradford, and at 43, Piccadilly, Manchester. A director:—C. W. Lowe.

CHAS. LOWE AND CO. (MANCHESTER), LTD., was also registered as a "private" company on January 26, with a nominal capital of £40,000 in £1 shares. The objects are to acquire the business of a manufacturing chemist now carried on by C. W. Lowe as "Chas Lowe and Co." at Reddish and 43, Piccadilly, Manchester. Other particulars are the same as those in F. C. Calvert and Co., Ltd.

MORGAN VERNEY AND CO., LTD., 87, Buckingham Palace Road, London, S.W.1. Registered January 16. Nom. capital, £300 in 250 ordinary shares of £1 each and 1,000 deferred shares of 1s. each. Manufacturers and importers of and dealers in chemicals and chemical products, and particularly all forms of paint, varnish, cellulose paint, enamels, lacquer and all compounds or combinations thereof, etc.

Canadian Fertiliser Industry

Production, Imports, and Exports in 1927

CANADA consumes very small quantities of fertilisers in relation to the great expanse of country devoted to agriculture. A recent survey of the fertiliser trade by the Dominion Bureau of Statistics in co-operation with the Department of Agriculture gave the amount of fertiliser sold for use in Canada in the year ended June 30, 1927, as 169,564 tons, and the area sown to field crops each year as about 56 million acres. The Bureau has just issued a further bulletin dealing with the manufacturing of fertilisers in Canada during the calendar year 1927, from which it appears that production from plants engaged primarily in the manufacture of complete fertilisers totalled in value last year $1,844,032. In addition, fertiliser materials such as calcium cyanamide, ammonium sulphate, animal tankage, ground bone and fish fertilisers were made in factories classified under other industries; in 1927, the production value of these commodities amounted to $6,278,707.

Only 12 plants in Canada produced complete fertilisers as a major product; 6 were in Ontario, 2 in Nova Scotia, 2 in British Columbia, and one each in Quebec and New Brunswick. Capital employed in these plants amounted to $1,998,811, and the average number of persons employed the year round was 233. Payments in salaries and wages totalled $224,564, and materials used in manufacture cost $1,200,030. Complete fertiliser was the major product of the industry. In 1927, production amounted to 49,593 tons, worth $1,670,507, or 90 per cent. of the total output of the industry. Superphosphate was actually made in only one plant, although several other manufactures of complete fertiliser sold quantities of superphosphate after dilution with a filler to meet the requirements of the trade. One concern was engaged solely in grinding and preparing basic slag. Production of complete fertiliser in other industries amounted to 22,000 tons, worth $876,524, while ammonium sulphate, cyanamide, animal tankage, fish fertiliser, and ground bone, used extensively as fertiliser, were also produced by concerns classified to other industries.

Imports of fertilisers and fertiliser materials during the calendar year 1927, amounted in value to $4,138,053. This total included superphosphate, manufactured fertilisers, sodium nitrate and muriate, sulphate of potash, basic slag, and ammonium sulphate. Exports were valued at $5,379,582, and included cyanamide, ammonium sulphate and manufactured fertilisers.

THE ROYAL SOCIETY will hold a discussion on "The Structure of Atomic Nuclei" on Thursday, February 7. After introductory remarks by the president, Sir Ernest Rutherford, it is expected that the discussion will be continued by the following:—Dr. F. W. Aston, Dr. J. Chadwick, Dr. C. D. Ellis, Mr. R. H. Fowler and Professor O. W. Richardson.

RUTHS STEAM STORAGE, INCORPORATED, New York, with an authorised capital of $1,500,000, and Ruths Steam Storage (Canada), Ltd., with an authorised capital of $300,000, have been formed to operate Ruths patents in the United States and Canada respectively. The whole of the issued capital of the company is owned by the parent company, Ruths Steam Storage, Ltd.

ARTIFICIAL SILK NEWS: British Celanese, Ltd. are believed to be interested in a new company formed for the establishment of an artificial silk factory in Yugoslavia.—It is reported that the daily production of the Branston Artificial Silk Co. is 1½ tons. The prospectus figure of 4 tons per day is expected to be reached in March.—Doncaster Corporation has been asked by the British Bemberg Co., who will erect an artificial silk factory in the town, to proceed at once with the construction of the highway on to the site of the works in order that the company may get their material to the site to commence building operations.